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DECIPHERMENT OF THE MOHENJODARO SCRIPT

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Part I

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THIS NUMBER

In response to enquiries from Dravidianists about the recent attempts at decipherment of the Indus Valley Script of the Third Millennium B. C. found at Harappa, Mohenjo-Daro and related sites by teams of Russian and Finnish Scholars, we invited these scholars to contribute articles dealing with their decipherment. A few other articles relevant to this subject are also included in this special number, in the hope that they will stimulate debate and discussion amongst scholars, contributing towards a successful solution of this difficult problem. We are grateful to the Editors of Antiquity for permitting the republication of items 8 and 9, the Journal of the Royal Asiatic Society for India, Pakistan and Ceylon for Item 10 and the Hindu for item 11.

Board of Editors.

A BRIEF SURVEY OF WORK TO DATE ON THE

Indus Valley Script

Arlene R. K. ZIDE

Papers from the 4th Regional Meeting, Chicago Linguistic Society
(University of Chicago: 1968)

1.0 Introduction.

1.1. The discovery of the cities of the Indus Valley Civilization in 1921 and 1922 by Banerji and Sahni at Harappa and Mohenjo-daro opened up a new chapter in the prehistory of man in India. The extensive excavations by Sir John Marshall and Ernest Mackay unearthed among other things, about 800 seals of steatite, and many copper plates incised with an unknown script of a pictorial, but, clearly, fully developed nature.

1.11. The script consists of approximately 300 signs, which can be divided into basic signs, about 250 in number, and various additional auxiliary marks which do not stand alone but which are used in combinations with the basic signs. These combinatory marks may be determinatives, vowel marks, punctuation, or other indications of gradation but it is not possible to determine at this point which analysis is correct. In addition to these signs, there occur many compound signs which are made up of the basic signs combined with each other, or basic and auxiliary signs combined. The number of signs has been variously presented as ca. 250 to ca. 375 in number; the discrepancies occur as a result of the manner in which one regards the auxiliary and compounded signs, the correct assignation often being a moot point. In any case, the number of signs, regardless of these various interpretations, would indicate that the script cannot be alphabetic, nor is it likely to be merely syllabic, but it is most probably assignable to a category which is known as logo-syllabic, *i.e.*, composed of logograms ("ideograms") which are used syllabically as well as logographically. Thus, if we employed our English logogram 2- pronounced *tu* with a logogram for "day" to produce 2- "today" *i.e.*, *tu-dey* in *rebus* fashion, this would be a syllabic use of logographic symbols.

1.2. In evaluating the attempts at decipherment of the Indus Valley script (or of any script, for that matter), one must bring into operation a series of criteria by which one may fairly and carefully judge the validity of the conclusions. These criteria involve

basically two aspects of the decipherment; *a.* the procedural and methodological evaluation of the script itself, and *b.* in the event of comparison with other extant scripts, the methodology of the comparison.

1.21. Thus, a would-be decipherer must have a thorough knowledge of (*a*) the historico-geographical area and its cultures, (*b*) the field of grammatology and (*c*) the structure and typology of writing systems. His procedures must include assessment of the statistics of the script. A count of the signs yields some of the most valuable information about the structural nature of the script itself. It is known, for instance, that an alphabetic system would have 50–130 signs, and a logographic, or more properly, a logo-syllabic system, since there are no " pure " systems, would generally be in the neighbourhood of 400 or more signs, usually around 600 signs. It has been shown that even the highly logographic system usually attributed to Chinese is based on a system containing 540 " keys," or basic signs from which the vast number of Chinese signs are composed.

Further, the decipherer must make sign-lists, in order to establish the frequency and order of signs which yield important information about the graphotactics—the relevant position and sequence of the signs. In addition, word-division should be established, and numbers, being easy to recognize, must be assessed.

1.22. In the comparison of scripts, the oldest or fullest forms should be used, and the originals from which they are derived must belong to the types of the same period; irregularities must be supported by analogies from other cases where foreign alphabets have been borrowed, and where the characters show considerable differences from their supposed prototypes, changes must be shown to have been made according to fixed principles.

1.23. Comparisons of pictorially represented writing, especially, must conform to these criteria, since the comparison of outer form is for the most part useless: pictorial representations would necessarily have to have many points of resemblance, since the objects which are represented are basically the same for all people. " Thus, men, and parts, of the body, animals and plants, tools and weapons buildings and structures, sky, earth, water and fire are everywhere represented by pictures characterized by great simplicity in form. . . . There is no need to claim for these signs one single origin." [1]

1.3. The civilization of the Indus Valley has been dated as spanning approximately 500 years, though there have been some

who would assert that a shorter chronology of about 3-400 years would be more in keeping with the archaeological evidence.[2]

1.31. S. N. Kramer would place the upper limit at 2800 B.C. on the basis of evidence from Susa and Kish,[3] since it would have taken several centuries for the Indus civilization to grow to the size it had become by 2500 B.C. but removed the date now to 2250–1700 B.C.

1.32. The chronology of the Indo-Aryan civilization in India on the other hand, has as its upper limit the date 1200 B.C., but recent reexamination of the literary evidence of the *Rig Veda* and *Atharva Veda* would place the limit as more probably around 1100 B.C., or even 1000 B.C. The archæological evidence as well points to such a conclusion, and to a definite break between the Indus Valley civilization and the advent of the Aryan invaders.[4]

2.0. The attempts at decipherment : most are invalid.

2.1. Most of the attempts to decipher the script must be considered to be invalid because of their lack of attention to the criteria as outlined above. Many of the attempts lacked completely in sound, rigorous methodological approach ; others were unsuccessful because of their complete inadmissability on the grounds of chronological incongruity. Thus, any attempt to interpret or read the seals of ca. 2300 B.C., or possibly earlier as a form of Sanskrit, (even " archaic " Vedic), as proposed by such would-be decipherers as Pran Nath, Ray, Gadd, Karmarkar and so on, is immediately discredited on chronological grounds.

2.11. Similarly, attempts to connect the script of the Indus Valley with the symbols of the Tantric Code, (as for instance, do Barua, and Sankarananda), fail to take into account, the great discrepancy in time lapse between the end of the Indus Valley culture, and the emergence of the Tantric Code many centuries later. In addition, one should note that the symbols and terms used in the Tantric texts are extremely ambiguous and obscure in nature ; thus reliance on a theory of connection based on the Tantric " code " would be, at best, tenuous.

2.12. Hrozny's " decipherment " of the Indus Valley script as Hittite, is invalidated for chronological reasons, aside from his obvious lack of sound procedure. As Diringer has pointed out, Hrozny's attempt is largely based on untenable strings of hypotheses, and unsupported revisions of chronological data, proposing a derivation of the Indus Valley script from the Hittite hieroglyphics of at least 1000 years later.

2.13. The contention by Waddell that the early Sumerians are Aryans and that the Indus Valley people were Early Sumerians (*i.e.*, " Vedic Aryans " sic) is another excellent example of the disregard of chronological data. Further, his methodology is highly questionable, to say the least. His derivations of English, Greek, Hindi and Sanskrit words from Sumerian betrays a lack of linguistic sophistication as to the nature of reconstructions and the need for rigorous, scientific method in accomplishing a decipherment.

2.2. Heras, similarly, betrays a certain amount of linguistic nai'vete in his reconstructions of " proto-Dravidian " as the language of the Indus seals. Although his notion of chronology is far more sophisticated than that of the preceding authors, his reconstructions of " proto-Dravidian " are not scientifically credible, since they are not based on sound historical and comparative techniques. His " proto-Dravidian " bears far too close a resemblance to Old Tamil than would be likely for a language of the (projected) age of " proto-Dravidian ". Proto-Dravidian is probably one of the more likely languages to be considered as a candidate for the language of the seals of the Indus Valley, since the chronological and archaeological data would not discredit such an hypothesis, at least. But Fr. Heras' " decipherment " leaves much to be desired in the way of scientific accuracy and methodological procedures. Lacking a solid reconstruction of " proto-Dravidian " forms, a scientifically and linguistically accurate notion of the structure of the writing system, and rigorous systematic procedures, Heras' " decipherment " cannot be taken seriously.

2.3. The comparison of scripts involves many pitfalls as well. Thus, the comparison of the Indus Valley script with the so-called " script " of Easter Island by de Hevesy, taken up later by others such as Heine-Geldern and Bilimoria is a striking example of fuzzy thinking. The Easter Island script is not a script at all. Unlike a fully developed script, whether alphabetic, syllabic or logographic, the Easter Island " writing " cannot be statistically assessed. Thus counts ranging from 120 to several thousands have been made for it. The range of variation of a sign is enormous, pointing not to a modicum of simplicity usually associated with a writing system which after all is presumably used for the purpose of communication, but to at most, semasiographic, pictorial representations which cannot be called a " system " at all. The distribution of the signs and the lack of groups exclude the possibility of phoneticism and the limited number of different symbols eliminates the possibility of the Easter Island writing being a pure pictography.[5]

2.31. The 200 or so signs which de Hevesy supposedly connected with the Indus signs were shown by Alfred Metraux, to be mostly inaccurate representations, with those resemblances remaining, being only of the oddest sort, not of the most characteristic signs. "Hevesy fails to explain how 2 scripts separated in time by 4000 years at least, can present minute and complicated resemblances in trifling details and at the same time be so completely different in all the essential elements." In his comparison of signs he chooses from the thousands of Easter Island signs small variations which appear once or twice, thus violating the principles of valid comparison of scripts as outlined above in 1.22. Further, here again chronology would indicate the impossibility of connection of two "scripts" over a period of at least 4000 years, preserved throughout the vicissitudes of wars and migrations, only to reappear on a Spanish war of the 19th century.

2.32. Another example of faulty comparison is that of Piccoli,[6] who compared 40 isolated signs on Etruscan utensils with simple geometrical signs found in the Indus script. Like all comparisons of this sort, resemblances are bound to appear; but the signs of the Indus Valley compared are just the widespread variety basic to any pictographic or even syllabic script, *e.g.*, circles, plusses, a zigzag line, a square with a plus in it, etc. Nothing conclusive could conceivably be inferred from such scanty evidence of identity. Further, of the various unknowns, Etruscan, is an unknown language which is in a known writing, thus these marks are presumably potters' or owners' marks and not scripts at all. The validity or even usefulness of a proposed connection between such diverse civilizations, based on the doubtful "evidence" of identity of a few minor, widespread, uncharacteristic signs is to say the least, questionable.

2.4. There have been two attempts at what might be termed "interpretation" of the seals, rather than actual decipherment. Readings are made without the actual reduction of the signs to phonological elements, or words of a particular language.

2.41. The treatment by Meriggi of the Indus Valley script is one of these interpretative attempts. Meriggi classifies the script as ideo-phonographic, presumably by this term he means, logo-syllabic, and attempts to classify the signs of the inscriptions into determinatives, ideograms, sic etc. He asserts that the script most closely resembles the Hittite hieroglyphic but does not go so far as Hrozny in identifying the language of the inscriptions as Hittite, or even Indo-European. Thus he does not postulate any phonetic

values for the signs, and his work must come under the category of preparatory work towards a decipherment, rather than any actual attempt at decipherment.

2.42. Like Meriggi, Petrie interprets rather than deciphers the seals of the Indus. His interpretation is based on proposed similarity of the writing of titles in Ancient Egypt to what Petrie contends are the administrative seals of the Indus Valley. A major objection to such an interpretation of the function of the seals, as merely seals of the officials of the government, is that there would have been as many officials as there were people in the Indus : often several officials per family, since several seals were often found in the same rooms and houses. Though it is certainly plausible that many of such seals were those of contemporary officials of the government, not all could have been, unless they were hereditary, possibly titular seals of authority, which passed from generation to generation.

The interpretation of these seals as administiative seals as do Meriggi and Petrie results in far too many administrative seals : if this defective theory is correct, then everyone in Mohenjo-daro for instance, was an official of the government.

2.5. Both Hunter and Langdon refrain from claiming that they have deciphered the script, and Hunter in particular, should be commended for his methodical, scientifically researched lists and tables of signs They both, however, would assert the connection between the script of the Indus Valley and the much later Brāhmī script. At the point Hunter argued for this connection, part of his assumption was based on the lack of knowledge of the lower limits of the Proto-Indian civilization. These limits are far clearer now and would thus militate against such a proposed connection because of the great gap in time. In addition, as Mr. Shapiro has shown, Brāhmī is derivable (as a consonantal skeleton with vowel markers) from North Semitic and is in structural character far removed from the Indus system, which is clearly logo-syllabic.

3.0. There have been, several serious and successful attempts at treatment of the Indus script. Those treatments which could be considered valid, however, are not full decipherments, or even interpretations of the scripts, but sound conclusions about various aspects of the system based on clear, demonstratable principles, often with analogies from the known writing systems of the world. Thus, the work by B. B. Lal of recent years on the direction of the

script, as based on discernible overlaps of incised signs on sherds, and the analysis of the possible numeral signs by A. Ross should be noted for their adherence to sound procedure.

3.1. Ross, is the only author who makes inferences from the number of different signs and one of the handful who employs scientific, evaluative procedures rather than rhetoric in his examination and conclusions about the nature of the script, or as in his particular treatment the nature of the numeral system. His conclusion is that the chief numeration-system is decimal, *i.e.*, that the base of the script itself is greater than 8 and not 11, and that 12 is not a change-point but is specifically indicated. Further, that the chief function of the numeral-signs appears to be a syllabic one, based on position of sign-groups and the proximity of certain numeral signs.

3.11. Lal's treatment indicates without doubt that the direction of writing of the Indus Valley inscriptions is from right to left, as has been heretofore suspected but never conclusively demonsstrated. Overlap of incised signs, and the careful evaluation of a seal, inscribed along three edges, furnish the concrete proof for this assertion.

3.12. Hunter also, as indicated above, aside from his untenable derivation of Brāhmi from the signs of the Indus Valley, has presented an excellent and full set of tables and lists, and evaluation of sign-groups, based on sound principles.

3.13. Smith, in his chapter on the " Mechanical Nature of the Early Indus Writing ", in *Mohenjo-daro and the Indus Civilization* makes a careful and useful evaluation of the structure of the writing system and the stratification of the seals, though correctly, he draws no conclusions from this early, brief study.

4.0. In summary, we may conclude that for the most part, the attempts at the decipherment of the inscriptions on the seals of the Indus Valley civilization have been unsuccessful ; except for a handful of methodic evaluations as outlined in section 3, . . . the " decipherments " have been based on untenable hypotheses, lack of chronological accuracy, unsound reconstructions because of linguistic nai've te, and in general, preconceptions of the language of the inscriptions which were not based on any systematic or rigorous evaluation but on *a priori* and untenable assertions. The linguistic principles of decipherment as presented in the early part of this paper were ignored or violated.

4.1. The script of the Indus Valley seals as we have it, one must conclude, is virtually undecipherable. The task of deciphering an unknown language in an unknown script is, to say the least, formidable. The inscriptions which are left to us, are far too short, and too limited in nature to infer any readings; further, the names of the civilization are lost to us, and as names usually provide the keystone of a decipherment, the possibility of breaking the script is extremely unlikely. What can be inferred about the script, is limited to certain structural conclusions such as its nature as a type of logosyllabic writing, the direction of the writing, and possibly the numeral-signs as outlined by Ross. A thorough evaluation of sign-groups incorporating the newer material from Lothal and Kalibangan would be a useful study preparatory to a possible later decipherment. Its connection with another known script is possible, but, as it is a pictographic script, conclusive rigorous demonstration would be necessary to prove that the resemblances were more than the predictable fortuitous ones, expected between any two pictographic scripts representing similar objects.

4.2. What is needed for a successful decipherment of the script are either bilingual texts, or longer inscriptions containing names, or place-names which could be identified and thus provide a key to syllabic values of certain of the signs.

4.21. For such aids, I believe, we must look to further excavations not in the Indus sites themselves, but in those of the earliest Sumerian, Ubaidian, and Elamite remains in Iran and places such as Susa, Jemdet-Nasr, and Kish where it is clear there is contact with the Indus Civilization at the early stages. Further, if, as Dr. Dales has suggested,[7] the lack of longer texts should be attributed to the use of perishable writing materials such as wax, we cannot hope to find longer inscriptions in India or Pakistan. Until such aids to decipherment are found. the most useful research on the Indus seals would be a careful preparatory compilation, perhaps by computer analysis, of all the sign-groups of seals including those from the recent excavations at Kalibangan, Lothal and other sites in India.

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[2] V. N. Misra, " Prehistory and Protohistory," *Review of Indological Research in Last 75 Years,* ed. Chinmulgund and Mirashi, Poona, 1967, pp. 375- , and A. Ghosh, " Archaeology in India," *Expedition,* Vol. VI, no. 3, 1964, pp. 12-17.

[3] " The Indus Civilization and Dilmun, the Sumerian Paradise Land," *Expedition,* Vol. VI, no. 3, 1964, pp. 44-52.

[4] Ronald B. Inden, " Early India : Literary Evidence for a Revised Chronology " University of Chicago, unpublished lecture ms. 1968, and A. Ghosh, *op. cit.*

[5] That is, in Gelb's terminology a *forerunner of writing,* using pictures as signs, *e.g.,* as among the American Indians or Eskimos pp. 250-1.

[6] Giuseppe Piccoli, " A Comparison Between Signs of the Indus Script and Signs in the Corpus Inscriptionum Etruscarum," *Indian Antiquary,* Vol. LXII, p. 782.

[7] George Dales, " South Asian's Earliest Writing," *Expedition,* Vol. I, No. 4, 1967, pp. 34-39.

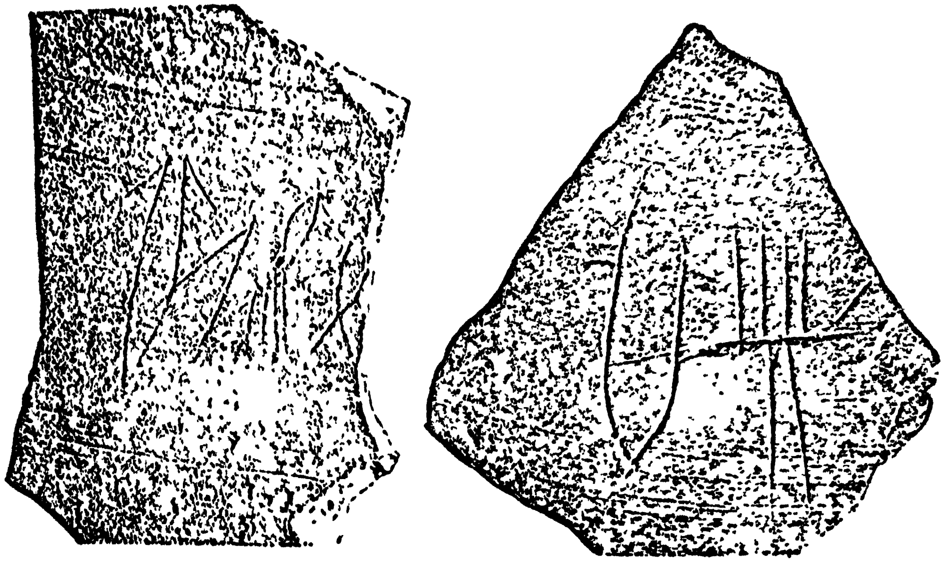

Figure 1 Inscribed Potsherds from Kalibangan (Rajasthan) in "The Direction of Writing in the Harappan Script" by B B Lal, Antiquity Vol XL, 1966

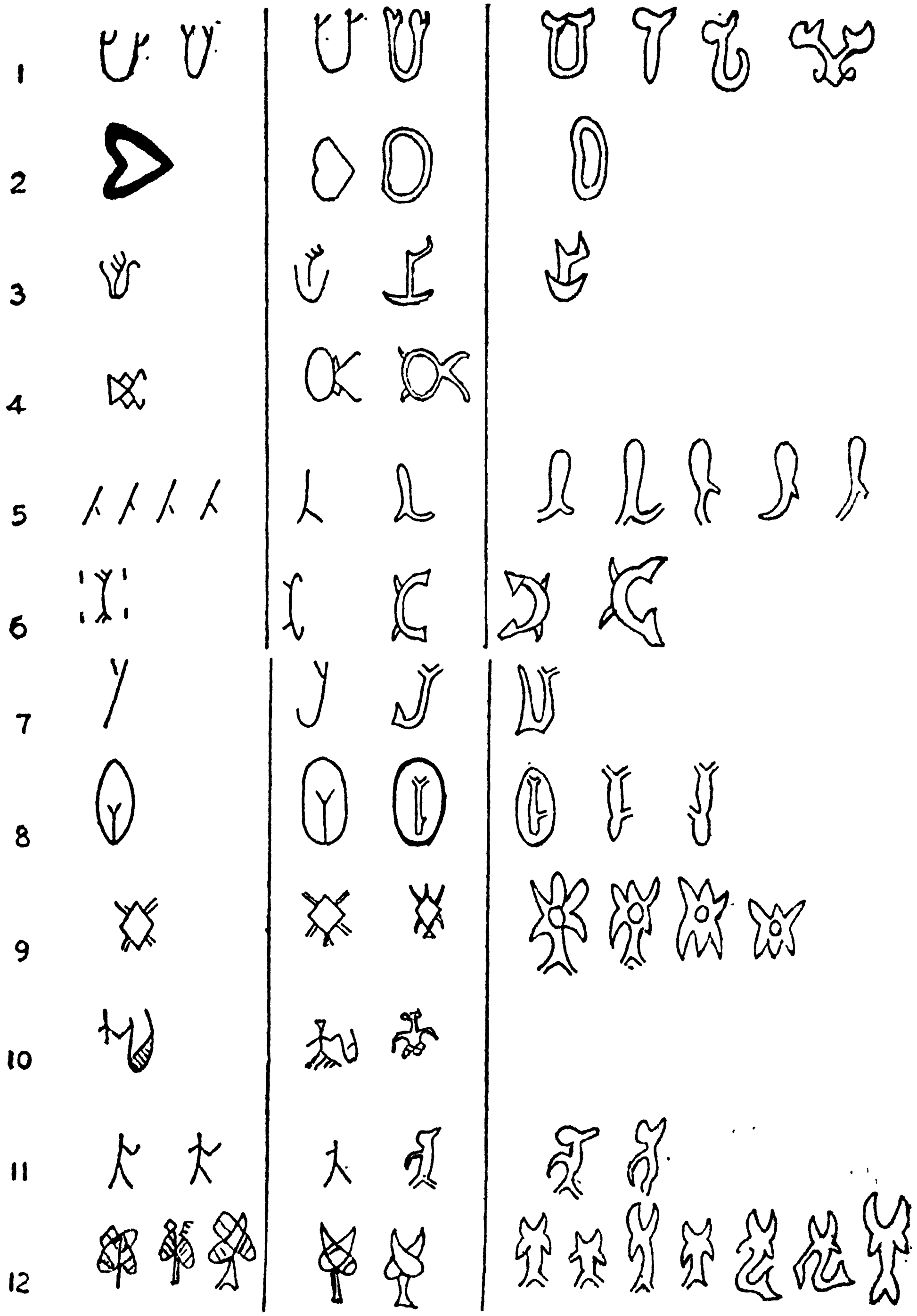

Figure 2. Comparison Between the symbols of the Easter Island Tablets and the Writing of the Indus Civilization, Man, January, 1938.

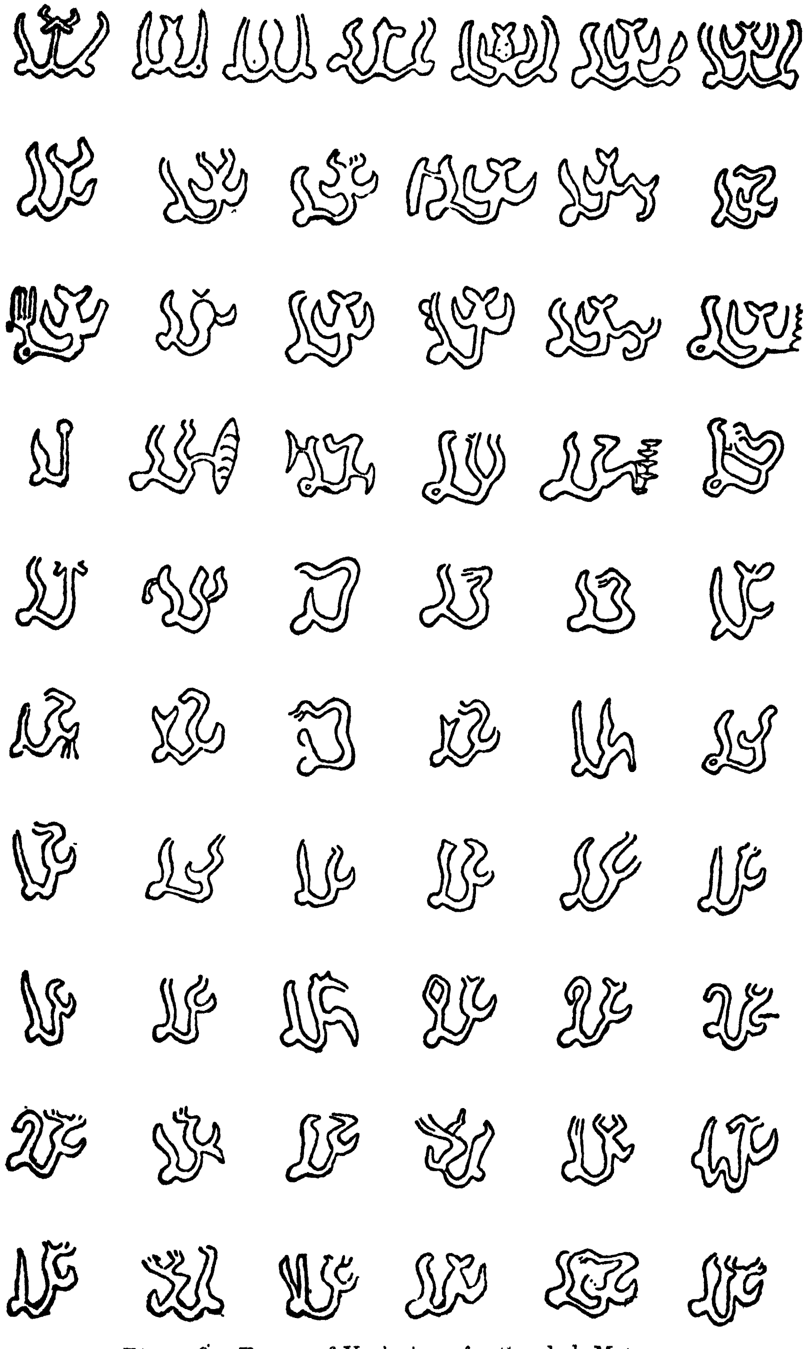

Figure 3. Range of Variation of a Symbol, Metraux, in Anthropos, 33, 1938.

The Formal Analysis of the Proto-Indian Texts*

Yu. V. KNOROZOV

0.1. The Proto-Indian inscriptions have been found over a wide territory which includes the ancient Saptasindhava (Harappa, Rupar, Kalibangan), the Indus valley (Mohenjo-daro, Chanhu-daro) and the peninsula of Kathiawar (Lothal).

Seals and imprints with the Proto-Indian inscriptions have also been found in Mesopotamia (Ur, Iagash, Umma, Kish) and Elam (Susa) with which the Proto-Indians had trade relations.

All the Proto-Indian inscriptions found so far are dated by the III-II millenium B.C. They are all executed in the same writing, which judging from the structure of the inscriptions represents the same language, although, possibly different dialects.

0.2. Only very short Proto-Indian inscriptions have been found so far. The earliest inscriptions of all known to date are written on thin small stone plates and figurines (VI-V Harappa layers; the corresponding Mohenjo-daro strata have not been excavated). Undoubtedly these inscriptions are not the earliest samples of the Proto-Indian writing. By the time these inscriptions were executed the Proto-Indian writing was apparently fully systematised, and comprised the whole corpus of signs known at present. The orthography from this very period discloses all the signs of stability.

The oldest plates and figurines have inscriptions and images on their two sides as a rule, and only very seldom were they executed on one side alone. Many inscriptions are repeated quite often on numerous plates.

0.3. "Reflected" inscriptions on stone seals predominate in later strata. These seals form the main bulk of the finds. Many inscriptions are often repeated on different seals and are accompanied by various pictures. The seals are square, rectangular or round.

The square seals bear an inscription (usually accompanied by the picture of an animal) on their flat side. On the reverse there

* This and the next article by B. Ya. Volchok are a continued version of their previous articles, 'Preliminary Report on the Investigation of the Proto-Indian texts' and 'Proto-Indica: 1968'

is a knob with an aperture and a groove on the top. Some of these square seals have a slit for an insert (sheath seals, M I, CIIq : M II, 95, 260, 343), but it is not known what tablets were used as inserts. In other cases similar plates could be fastened crosswise to the flat side of the seal by a string passed through the hole in the knob or running along the groove (however, there are no visible traces of the strings left).

There are as well round Bahrein type seals with a circumferential inscription on the flat side, a knob with an aperture and three grooves (early Bahrein type, Ur, Gadd, 1933, No. 12) or one (late Bahrein type, M II 500) on the reverse.

Square and round seals with both sides flat bear the inscriptions and pictures carved on both sides (square, M I 311 and 508, 475 and 476 : M II 577, 636 ; round M II 604) or even on narrow rims as well (M I 227 230 356, 471 472-473, M II 405) or, as the case may be, on one side only (square M I 120, 477, unfinished? M II, 173, 189, 299, 492, 631).

Rectangular seals have a "reflected" inscription on the flat side and a hole in the convex reverse side (sometimes a knob with a hole, M II 510, 661).

We must mention also rectangular seals with inscriptions and pictures on both flat sides or one side only, several cylindrical seals of the Mesopotamian type (M II 78, 376, 488 : XC, 17 ; Susa), and at last ebony sticks with "reflected" inscriptions, possibly used for imprinting (M I 529 533).

0.4. Sealings are found only in small numbers. This may be explained by the fact that only baked clay sealings withstood the time.

Clay "tags" with seals imprinted on them could be fastened to the goods during packaging. The imprints of seals on trade "tags" could be preserved only in those cases when the tags became accidentally baked, *e.g.*, when old packaging mats were burnt down (Gordon, 1958, 64). Round seals could be imprinted on clay stoppers which were broken when the vessels were opened.

On some sealings discovered in Lothal several rectangular seals were found imprinted one above the other. The imprints were made on a clod of damp clay put on a stick. The clod was then placed in a special over, covered with cane and baked (cane and finger prints are preserved). The stick burnt out and left an aperture which was possibly used for fastening (Rao, 1956–57, 86).

The bulk of the finds is made up of flat clay (sometimes faience) plates baked deliberately. These usually have imprints of two rectangular or round seals (on the obverse and reverse). The same seal is imprinted on both sides (sometimes there is room for only part of the seal). Trihedral baked clay prisms (M II, 1, 3, 8, 10, 14 ; XCII, 4 ; CI, 10, 13 ; CII, 14) with the imprints of different rectangular seals on each of the three facets are round as well as cubes (M II, XC, 16, 19 : CII, 3) with rectangular seals printed on all (or some) sides. There are many plates with identical imprints. In the opinion of most of the authors such baked imprints served as amulets (talismans), votive offerings or were given by the priests to the visitors of the temples as a token of their observance of a religious rite (Marshall, II, 397).

Some sealings were executed on the vessels before baking.

0.5. Apart from the "reflected" inscriptions on seals and their imprints there are "unreflected" inscriptions on stone plates (not on miniature ones as in the early Harappa strata, but having a similar form with the seals (M II, 327, 328, 394, 400, 401, 497), the seals themselves (alongside with a usual "reflected" inscription : M II 352, 587), as well as on copper tablets, ceramics, metal implements and tools, clay bracelets and other small objects.

1.1. In the vast majority of cases the inscriptions consist of one horizontal line (on round seals they are circumferential) which is read from the right to the left (in the "reflected" inscriptions on the seals, correspondingly –from the left to the right).

The proof of the reading from the right to the left may be seen in the compression of the signs on the left side of the line (*i.e.*, at the end of the inscription) in some inscriptions, a free margin to the left of a short inscriptions, and in particular, in case of an inscription being carried over to the second line (*e.g.*, the final signs of the upper line of the inscription on seal M I 247 are carried over to the second line in seal M I 139). These observations are supported by such facts as the continuation of the inscription on the left lateral side (H 254) and the observations on the order of sequence among the signs (Hunter, 1934 ; Alekseev, 1965 ; Lal, 1966).

If an inscription is accompanied by the picture of an animal, the latter is so oriented that the inscription might be read from the head to the tail, although sometimes the animal may be oriented inversely and the inscription is read from the right to the left—from the tail to the head (H 617, Ch. 22).

There is a small number of exceptions when the inscription is read from the left to the right (M II 394 ; H 273), from the head to the tail of the animal (M II 651 ; Ch. 21), or from the tail to the head (M II 516 ; H 217).

When an inscription has many lines, the second line and following are also read from the right to the left (M I 12, 237, 400 ; M II, 519, 564 ; H 251), although boustrophedon is attested as well (M I 247 ; M II 405, 604 ; Ch. 4).

In some cases, especially on small stone tablets the inscription comes over from the obverse to the reverse where it is read either from the left to the right (a variety of boustrophedon), or, as usual, from the right to the left. The inscriptions on the obverse and reverse of many doublesided seals and sealings are syntactically not connected with one another. There are cases of identical inscriptions (though with different accompanying pictures) on both sides of one seal.

1.2. The Proto-Indian inscriptions are executed in continuous lines without any intervals between words or special signs denoting the word limits (although there are unique cases when a line may be divided into sign groups, *e.g.*, H 44, 658).

To identify sign groups corresponding to the linguistic units the Proto-Indian texts (converted into a digital code) were automatically processed, and all sign groups occurring two or more times (intersections in mathematical terms) were thus registered. At the same time the program registered recurrent sign combinations separated by other signs within the whole inscription (interval statistics).

To check the efficiency of this program its applicability had to be tested with regard to any continuously written text other than Proto-Indian. A control experiment was carried out with an unsegmented Egyptian text (about 1500 symbols). The experiment has shown that the number of random sign combinations is insignificant even for such a small text. It also turned out that the boundaries of the sentence are well determined. It is precisely the small size which limits the segmentation and study of the Proto-Indian texts ; a text at least 10,000 signs long is necessary for a meaningful formal study (in the opinion of some theorists this size should be by far larger). The specific character of the Proto-Indian texts (short standard formulas) presents less difficulties, since the high frequency of certain wordforms (which reflects the

specific character of the inscriptions) is easily resolved when relative statistics is applied.

The control experiment was staged with only one aim of testing the efficiency of the program (Probst, 1965). Any other hieroglyphic text could be taken instead of Egyptian (thus, hieroglyphic Maya texts were processed in a previous unsuccessful control experiment at the Mathematical institute of the Academy of Sciences of the U.S.S.R., Siberian Branch). Naturally, the Egyptian language or hieroglyphics were not supposed to be compared with the Proto-Indian language or writing.

The Proto-Indian inscriptions were converted into an unsegmented continuous numerical transcription (boundaries between separate inscriptions were not marked); random combinations which occur at the junctures between the inscriptions were to be examined as a comparative material.

As a result of the work random combinations were excluded in the majority of cases. The remaining intersections which correspond to the units of the language were isolated and will be referred to as blocks.

At the same time the inscriptions were segmented on the basis of the study of their structure. It turned out that the same block is repeated in many inscriptions. In its minimal form an inscription may consist only of this principal block; in other cases the latter is augmented by supplementary ("explanatory") blocks usually from the left, but in isolated cases from the right.

Theoretical considerations led to a supposition that according to the technique used the blocks will represent not only word-forms plus the corresponding word-and form-building affixes, but those plus prepositions, particles, conjunctions etc., and even unchangeable attributes (if they are present) devoid of their morphological formants. Such attributes are practically indistinguishable from subordinate elements in unknown texts (Knorozov 1966).

On the fig. 1 are given the specimens of segmented inscriptions with an identical principal block.

1.3. Circumgraphs are often attested in the blocks. The central sign (sometimes a diagram) is surrounded in this case by two identical or similar graphemes, namely short strokes. The combination of these two graphemes without central signs makes up an independent sign. The comparison of the blocks shows that such

a spelling represents an orthographic norm (rather than a linguistic one) : the sign is inserted into the preceding one which consists of several elements—a split or symmetrical spelling, (cf. Hunter, 1934). On the fig. 2 are listed the blocks with circumgraphs.

In certain blocks the circumgraphs consist of two or four long strokes as well as of other graphemes. In some cases small-sized signs are written in the middle of the preceding symbol, and the adjacent large symbols are sometimes merged into a ligature (*e.g.*, 13X27).

2.0. The signs constituting a certain block can be divided into two main groups : constant and variable ones. Constant signs are retained in all cases when the given block occurs, they render root morphemes in all probability. Three groups are distinguished among variable signs. The first group is composed of properly variable signs (the most flexible). They occur at the end of the blocks, *i.e.*, in the position usually occupied by form-building suffixes and other morphological formants. Other variable signs should properly be called semi-variable, because they occupy an intermediate place between the variable signs proper and the constant ones (they are closer to variable signs). The semi-variable signs are subdivided into two markedly different groups. The semi-variables of the first group always precede the variable signs proper (if these are present), and immediately follow the constant signs, *i.e.*, they occupy a position usually taken up by derivative suffixes. The semi-variables making up the second group always precede the constant signs ; together they compose a combination which remains stable within one micro-paradigm. In most cases the semi-variable signs of the second group are attested in one block only, or several which form a thematic grouping. The same constant combination or sign may be augmented by a whole series of unique semi-variables of the second group which seem to represent syntactical formants rather than morphological.

2.1. Variable signs proper which occupy a terminal position in the blocks are limited in number due to the standard character of the inscriptions. Some variables are combined with each other, as well as with semi-variables of the first group (fig. 3). On the fig. 4 general micro-paradigms are given for an illustration (variable signs are hyphenated).

2.2. The semi-variable signs of the II group are found only to the left of the constant (fig. 5). Some are attested in one block only. Numbers (apparently rendering numerals) are often among them.

3.1. In spite of the brevity and standard character of inscriptions, we can mark out the following characteristic features of the Proto-Indian language.

There is a set word-order in the sentences. Attribute is prefixed to the word used. Before another noun, a noun performs the function of adjective, without the addition of affixes. Numerals are joined to the nouns without the affixes of plural number. There are only suffixes in the language (not a single prefix is there). Suffixes can be combined in twos (sometimes in threes) in certain combinations.

3.2. Taking into consideration the antiquity and the area of distribution of Proto-Indian Culture, it can be assumed that the Proto-Indian language is either a dead language or, is related to the Indian languages (Indo-European, Dravidian and Munda) or to the languages of Middle East (Sumerian, Hurrite, and Elamite). The question about the affinity of Proto-Indian language with one or the other language family was decided by means of successive examination.

The Proto-Indian language is not close to Sumerian, Hurrite and Elamite languages because the attribute in these languages is used after the word. Besides that, in the Proto-Indian language, we do not find prefixes, characteristic of the Sumerian language, combination of 'postpositions' and 'division into syllables' of indexes, which is characteristic of Hurrite and Elamite languages.

Similarly, we cannot relate the Proto-Indian language with the Indo-European languages (including Sanskrit and Hittite), because of the absence of prefixes in the former.

The Proto-Indian language cannot be related to Munda languages either, because in the Proto-Indian language we do not find prefixes, infixes, strongly expressed agglutination, which is characteristic of the Munda languages.

3.3. There are grounds to consider that the Proto-Indian language is close to Dravidian language in grammatical structure. In the Dravidian languages as also in the Proto-Indian language, attribute is used after the word it attributes; combinations of two nouns can be used, the first one as attribute, without any affix and a numeral can be used before a noun without the affixes of plural number.

In the Dravidian languages, as also in the Proto-Indian language, there are no prefixes, and suffixes (case endings) can be combined in twos (forming new cases).

Many Proto-Indian words and combinations of words were, undoubtedly, traced to Sanskrit (and partly borrowed). This gives an opportunity to determine the approximate meaning of some of the Proto-Indian words. Unfortunately, for want of sufficient epigraphical material, it is not possible to make a thorough study of the grammar and vocabulary of the Proto-Indian language. Most of the words in the inscriptions have been used only once and it is impossible to fix their meaning from the context.

4.1. About 350 signs compose the Proto-Indian alphabet. Many signs are relatively little conventionalised and may be interpreted. Apparently many pictographic symbols were used as standard material for the alphabet (no samples of the Proto-Indian pictography have been found so far). The signs represent almost exclusively contours of whole objects. The representation of the whole by its part was used very seldom.

For the sake of economy, the symbols are often turned by 90° clock- or anti-clockwise.

4.2. Vertical short strokes occurring in combinations from one to nine are undoubtedly numbers and constitute a special group of signs. The Proto-Indians used decimal numeration which is proved by the rendering of numbers as well as by the discovery of a graded scale. The sign 43 was apparently used to denote 10. In some blocks, however, the numbers 12 and 24 are written only by means of short strokes.

There are many blocks in which numbers function as semi-variables of the II group standing before the root symbols.

The first group is composed of blocks with varying numbers and the constant root sign (fig. 6).

Judging from the successive increase in numbers as well as the use of such blocks, the number represents quantity and the root sign stands for a unit of measure. Thus, the sign 24 which represents apparently a human palm may denote a unit of measure known as " handful " in the Indian system of measures ; the sign 14 representing a porter denotes the measure known as " burden ". The sign 31 denotes a vessel as seen from a comparison with contemporary pictures.

The second group is made up of blocks in which a definite number forms a stable combination with a definite sign or group of signs (fig. 7).

These blocks may render stable combinations with numerals. Such stable word combinations with numerals are quite common in the languages of India.

In other cases numbers were probably used not to denote quantities but in a different meaning. Thus, numbers 1, 2, 3 are used as final variables. The figure 4 is used far too often to represent only quantities. Some combinations definitely imply a homonymic use.

4.3. Some signs may be interpreted by their shape. In some cases interpretation may be facilitated by the comparison between signs as well as by the comparison of the signs with the contemporary Proto-Indian pictorial representations and archaeological findings.

Attempts as discovering a system of writing related to Proto-Indian have so far been unsuccessful. The identity or similarity of certain Proto-Indian signs with Hittite, Easter Island or other alphabets is either purely fortuitous or of a convergent nature (*e.g.*, the " fish " or " man " signs).

The signs are identified with a varying degree of certainty. In some cases only a class of objects may be referred to. The following are some of the identified signs: 1—man; 2—convict with a leg in stocks; 3—running man, runner; 4—a horned personage, a deity; 5—a female personage with arms raised and large breasts hanging down. cf. similar personages in the prehistoric rock-painting of Central India (Gordon, 1958); cf. also the pictures on Proto-Indian pottery. Raised arms can be treated as a gesture invoking rain. A popular image of the Goddess of Fertility; 6—man with up lifted hand (a popular gesture of blessing or salutation); 7—spearman; cf. representations of the God Skanda with a spear on punch-marked coins (Allan, 1936); 8—bowman, archer; 9—a personage with two bows, a deity (?); 10—a personage with a shield; 11—kneeling adorant with a vessel; 12—a personage with a club on his shoulder; a deity; cf. the images on trehedral clay amulet (H 305) and on ivory plaque (M II, CXXII,); 13—porter, carrying a pole with ropes on his shoulder; 14—a variant of the previous signs; 15—quadruped (the sign is turned 90° clockwise); 16—quadruped (the sign is turned 90° clockwise) a big pead, four legs and a crooked tail are shown; the number

of the strokes denoting legs varies from four to two sometimes they are dropped altogether; according to P. Meriggi (1934, 235)— " a horse ", which is hardly possible; 17—running animal (striped hyena?); according to Hunter (1934, 81)—" a jackal "; shown are the trunk with oblique stripes, fore—and hindlegs, the head with pointed ears and the short tail (the sign is turned 90° downwards); 18—quadruped animal; 19—flying bird; cf. the representation of " Garuda " (H 255); 20—fish; 21—whiskered carp—fish with fins and whiskers seen; 22—crab; shown are the claws and eight legs (the latter are often omitted); 23—beetle with horns and legs seen; 24—hand (?); 25—hands; 26—mane of a zebu; 27—stylised representation of the aśvattha tree (Ficus religiosa L.); cf. the representation of a goddess in the aśvattha and the decorative variants of the sign; 28—leaf of the aśvattha (pipal) tree; 29—(?) 30—fence; shown are vertical poles with forks, tied horizontally with twigs; 31—vessel; 32—vessel with a ladle or spoon; 33—(?) 34—bow and arrow; 35—arrow (?); javeline, lance; 35—fishing hook; 37—harp, lute; 38—an instrument with long teeth; 39—(?) comb (?), rake (?); 40—river (?); 41—(?) 42—mountains; 43—(?) 44—(?) 45 - (front) leg of some cloven-footed animal; cf. representations of the legs of bull, buffalo and other hoofed animals; 46—crescent moon (?).

5.1. The exacavations made by M. S. Vats discovered in the early archaeological levels of Harappa tiny plates made of burnt steatite. Most of these plates bear the brief inscriptions of the same type, consisting as minimum of a basic block and a complementary inscription. In some cases another complementary block is added to the basic from the left side.

The additional block from the right side consists of a radical sign 31 preceded by the numerals (from 1 to 4). Sometimes identical inscriptions differ only by the numeral in the right complementary block (H 381, 405, 508, 566).

The sign 31 seems to represent originally a vessel with a round bottom. The same cup is carried by an adorant in the scenes engraved on Proto-Indian seals—cf. for instance the scene with a sitting god and the scene of " tree-worship " (M II, CIII, 9; XC, 23). Sometimes the sign 31 is replaced by the sign of a kneeling adorant with the cup (or adorant standing in a " dancing " posture with the cup in hand), as, for example, H 372, 412, 453.

5.2. There are more than 60 basic blocks in the Harappan inscriptions on tiny plates. Many basic blocks are barely visible

on the photographs. Some of more or less clearly distinguishable basic blocks were interpreted previously as the denominations of various deities: the names of constellations, the goddess with raised arms (in combination with different epithets), a personage with a warder on the shoulder etc.—see above 4. 3. The inscriptions of this type have usually (in the basic blocks) the specific variable sign 38, single or in combinations 25–38, 35–38. In many cases, however, the final variable signs are dropped altogether (fig. 8).

The complementary blocks, added from the left side, are of the lesser frequency—in comparison with the right (final) block (H 461, 475). Sometimes, between the basic and final blocks is inserted another additional block of rather different type (H 477, 485, 586, 342, 356, 344, 487). In those cases the block with the "cup" sign is occasionally dropped. Cf. for instance H. 454, 658.

5.3. The final block almost completely disappears in the late inscriptions from Mohenjo-Daro and other Proto-Indian sites. Very rarely it occurs with the numeral 4 only and even in those solitary instances is placed *to the left* of the basic block (M I 532; M II, XC, 23).

The image of the tree and the kneeling adorant with a cup we find on the sealing M II, XC, 23. Much earlier (H 305) the sign 31 is stamped on the amulet at the feet of the deities. As it was pointed out before, the sign, representing an adorant with a cup, can replace the sign 31 in the final block of the Harappan inscriptions in combination with the numerals. If we take into account the fact, that the group of radical signs in basic blocks can be interpreted as denominations of gods and goddesses—by means of comparison with contemporary Proto-Indian images and some later specimens preserved in Indian mythological and iconographical tradition, it seems to be quite plausible to interpret the whole group of the inscriptions on tiny plates as obviously connected with a certain type of sacrifice (particularly—drink-offering). The numeral denotes the number of the sacrifices, although the forms of offering could be different (for instance—two drink-offerings with two kinds of liquor). The different combinations of the variable signs at the end of basic blocks indicate, probably, on some modifications in sacrificial formula (such as "an offering /given/ to the God "God's offering" etc.).

5.4. The sealing M II, XC, 23 is a rare case of conformity between the picture (representing the process of sacrifice) and the

sacrificial inscription. As a rule, the image is not an " illustration ", but rather a supplement and has its special value, not identical with the meaning of the inscription. On the early plates we find only the image of the fish engraved after the inscription. It was probably too difficult a task to draw a more complicated picture on such miniature objects. The late Harappan prints on clay, made after specially prepared seals, bear different images and symbols at the right side of the inscriptions.

Even on early plates there are contracted inscriptions without the final block. They bear the images of different animals (fish, gharial, etc.—cf. H 411, 429-438). On some plates with the complete (H 665) or abbreviated (H 440) inscriptions there is sometimes a drawing of the so-called " incensory ", which on the later seals, combined with the unicorn (H 314), becomes one of the most frequent types of images.

5.5. The early stone-plates usually bear the inscriptions both on the obverse and reverse side. The same case is with the later impressions on clay, where the inscription was stamped on both sides with two different sets of the seals. The basic block was impressed on the obverse side of sealing.

The texts engraved on a number of the late seals strictly correspond to the inscriptions made on the obverse of the tiny stone-plates from Harappa (*i.e.*, include the same basic blocks with the same group of variable signs). It seems probable that the seal inscriptions of this type represent a *part* of the sacrificial formula. The reverse side of the tiny plates was reversed for the final block and the image (cf. for instance, H 314, 324, etc.). In some cases however on the reverse side is stamped only the image of a certain deity—probably the same god (or goddess), whose name is indicated in the basic block on the obverse. Instead of the image of a deity we find sometimes there the image of a tree, usually enclosed in a railing or platform (H 325, 327 ; cf. M II XC, 23). The early stone plates (as well as the late sealing with the texts of the sacrificial type) seemingly were distributed by the priests among the adorants, intending to perform a certain kind of sacrifice. (This particular type of the sacrifice probably could be done by the temple staff only). It is known that in the centers of the Proto-Indian civilization the sacred trees were used as temples (cf. Mackay, 1938). The images of the trees on clay sealing confirm this hypothesis of the archaeologists made thirty years ago. It seems probable that the sealings with the sacrificial inscriptions bear the images of real sacred trees worshipped at Harappa.

5.6. Besides the sacrificial texts we can find on the Proto-Indian seals and sealings many other types of inscriptions. Thus, we should like to mention the inscriptions with basic blocks ended in a standard combination of the variable signs: -27-1. The texts of this type could convey the proper (mainly—theophoric) names, the titles etc. The inscriptions denoting the names of various gods could be made on the trade seals as well. The texts made on the burnt sealings (probably—amulets or talismans) should be delivered to the apothropeic (protective) type (cf. for instance—M II, CIII, 1). We can state therefore that the content of the Proto-Indian inscriptions is by no means limited or monotonous.

PROTO-INDIAN SIGNS

The numerical signs are transiliterated by Roman Figures—I. II, III, IV etc.,

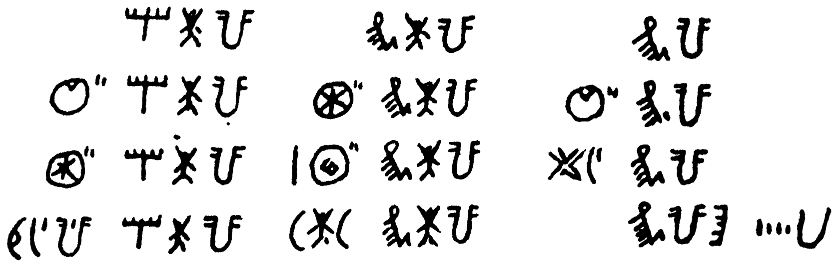

Figure 1. The Inscriptions divided into blocks.

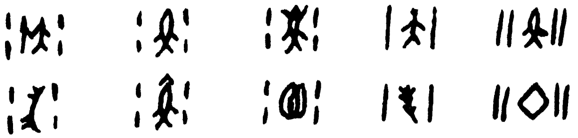

Figure 2. Blocks with circumgraphs.

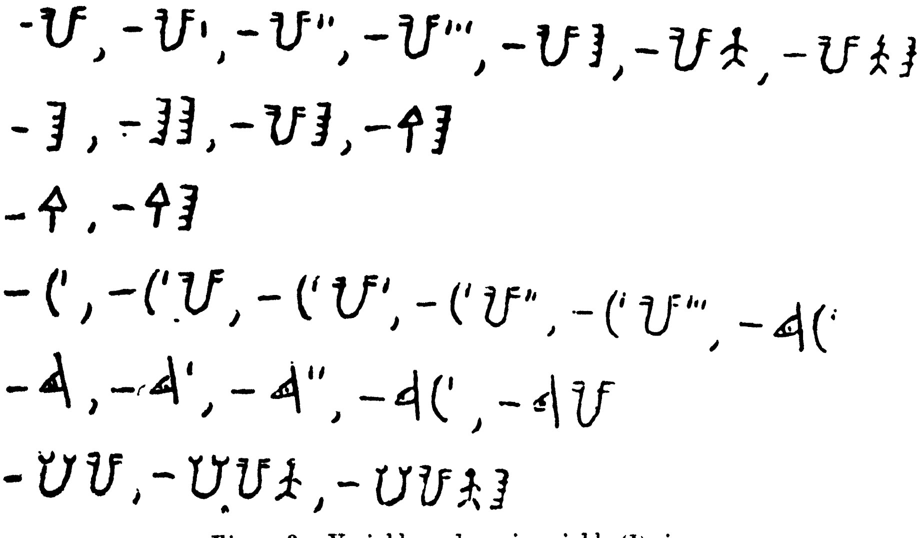

Figure 3. Variable and semi-variable (I) signs.

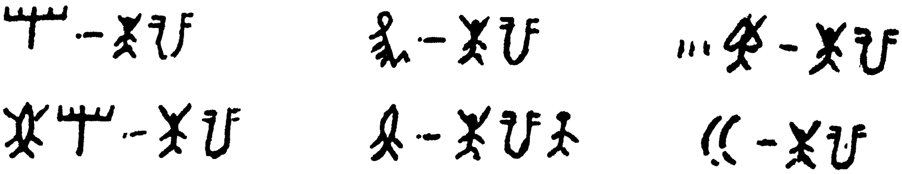

Figure 4. Blocks with semi-variable (II) signs.

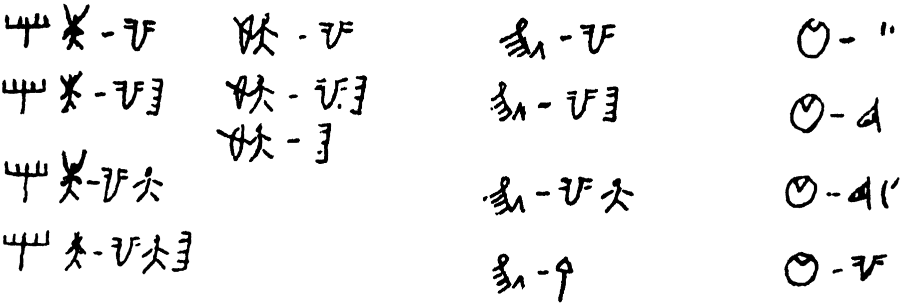

Figure 5. Micro-paradigms of the variabe signs

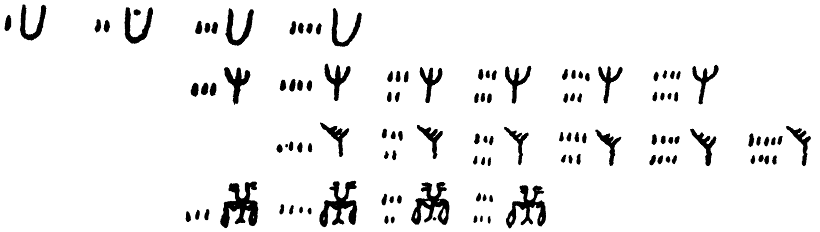

Figure 6. Blocks with variable numerals

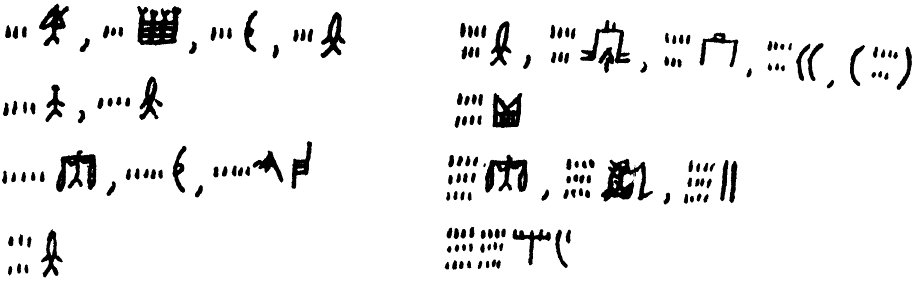

Figure 7. Blocks with constant numerals

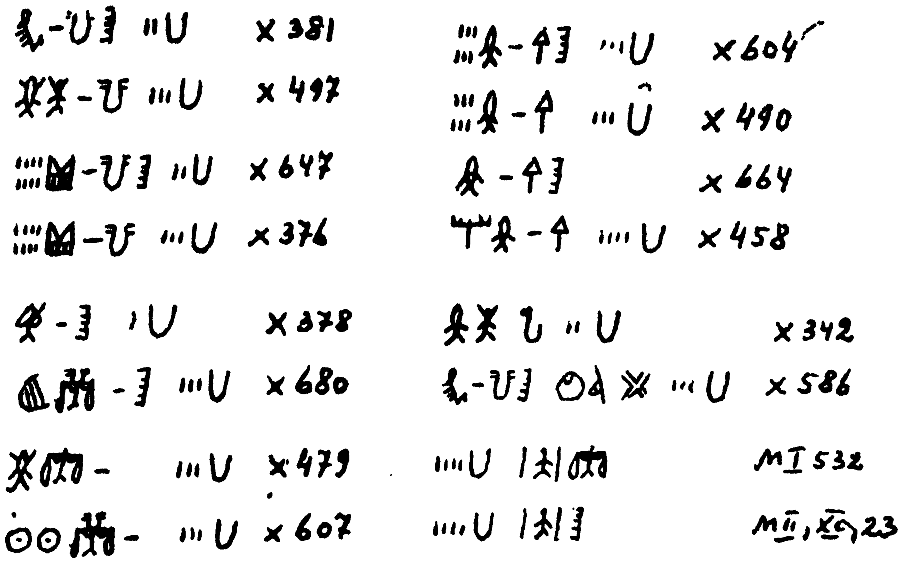

Figure 8. Sacrificial inscriptions

Towards an Interpretation of the Proto-Indian Pictures

B. Ya. VOLCOK

0.1. It is a well known fact that classic Indian culture is a produce of interrelation and interaction of various cultures existing in different historical period on the territory of the Indian subcontinent. Indian mythology, religion and ritual as they were formed and already established in the classical period contain a series of lecal (non-aryan) elements. The first investigators of the Proto-Indian culture found out an obvious connection between the Indus Valley civilization and the later Indian tradition (J. Marshall, E. Mackay, M. S. Vats). Among all kinds of archaeological finds in the Indus Valley, especially among the objects which can be qualified as religious, one can most clearly observe their immediate connection with the later culture of India. Considering a strong stability of Indian religious tradition (mythology, iconography, ritual) one can suppose that there existed a far greater succession of the classical Indian culture to the Proto-Indian culture, than it has been considered until recently. Hence the importance and necessity of studying of Sanskrit texts (the main literary source of ancient indian religion) is obvious. But it should be remembered that the chronological gap between the Proto-Indian culture, and the material used for comparison is about one and a half thousand years or even more. Therefore a complete identity of the objects uuder comparison is simply unthinkable. One can only speak of separate Proto-Indian elements being included into the later Indian culture. No less important is the study of mythological and religious tradition of different ethnic groups in India not included in the classic literary canon.

0.2. Several methods can be applied for the identification of Proto-Indian mythological personages. Some of them can be directly identified with the well-known deities of the great Indian religions (Vedic, Buddhism, Jainism, Hinduism). On the other hand one should keep in mind that among the signs of the Proto-Indian script there are more or less stylized pictures of real mythological personages, animals, plants, different objects and emblems. In some cases it became possible to identify some objects represented by the signs with their synchronous Proto-Indian pictures, and further on to compare them with the data of later religions of India.

Finally, some slightly stylized signs having no parallels in contemporary imitative arts, offer an opportunity to connect them directly with the data of the later Indian mythology and iconography.

0.3. The comparison of the Proto-Indian inscriptions and pictures as well as the formal analysis of the former allows to elicit the blocks which render the names of certain mythological personages and to establish a number of names of various mythological personages whose representations have not yet been found among the Proto-Indian monuments.

It is possible that some Proto-Indian mythological personages and deities adapted *mutatis mutandis* by the later Indian religions were adopted through their medium by the peoples of the Indian sub-continent, among their number – by the Dravidians.

Therefore the ancient Indian literature containing the descriptions of deities and their names may be used for comparison. Evidently the Sanskrit had copied the names of some Proto-Indian mythological personages and deities. This fact enables us to examine the names of those deities whose representations in the Proto-Indian culture have not been preserved.

0.4. Certain Proto-Indian mythological personages go back to the remote Neolithic past. Thus, a female personage with uplifted hands, a common Neolithic symbol of the fertility goddess, is represented only by the sign 5, whereas the corresponding deity is usually represented as a woman with the hands down.

Even in the Proto-Indian art already the female deities are mostly represented with their hands down. As an exception several figures on the amulets (M II, C, 1, 2, 3 ; H. XCIII, 304) and one-two clay figurines (H. XII, 1 ; XIV, 9) can be pointed out. This ancient personage completely disappeared in the later Indian iconography. One can find the images of female deities with uplifted hands only in such primitive cultures of India as cave and rock paintings (Gordon, 1958) or in religion of some aboriginal tribes, particularly, among the munda and dravidian tribes of Central India (Elwin, 1951).

1.1. Proto-Indian inscriptions are often accompanied by emblems, plants, animals and various scenes. Amongst the emblems the most common are *śvastika* (widely spread in the later Indian symbolism) and lattice (included in the so-called "standard"). Amongst the plants only the pictures of *aśvattha* and palm-trees are found separately.

Most often we come across the isolated figures of " unicorn " (before " standard ") and rarely of bull, buffalo, elephant, rhinoceros, tiger, gharial with a fish in its teeth, antelope looking back across the shoulder and of goat.

It is noteworthy that some of the characteristic animals of ancient India have not been depicted on these objects, such as, lion (widely represented in the later Indian heraldry). Even in the Proto-Indian version of the figure of the Mesopotamian hero Gilgamesh, gripping two lions, we find them replaced by tigers (M II, NN, 75, 86, 122, 454).

1.2. Besides realistic figures, we also come across anthropotrizavr (bull with human face, trunk of an elephant and with the tail of a tiger) ; tigers with horns of zebu ; " unicorn "-trikefal (upper head that of an antelope and the lower one of a bull) ; rhinoceros-trikefal (upper head that of an unicorn (?), lower one that of bull) ; dikefal (body of rhinoceros with heads of antelope in front and back) ; ektozavr (star-shaped figure with heads of " unicorn ", buffalo (?), tiger, zebu and bull ; there is another version of this figure with the head of a " unicorn ").

1.3. On a number of amulets are depicted politerions—groups of animals, often appearing in rows one after the other :

tiger-buffalo (?) - rhinoceros-elephant-gharial with a fish-bird (three-edged amulet, M I, CXVI, 14 ; CXVIII, 10a) ;

buffalo ? - bull-unicorn-tiger ? - gharial with a fish-bird (three-edged amulet, M I, CXVI, 14 ; CXVIII, 10a) ;

" unicorn " - elephant-rhinoceros-gharial with a fish-bird (three-edged amulet, M II, XC, 13b) ;

tiger-elephant- " unicorn " - bull-scropion (?) (M II, XCI, 13, 19a ; H. CII, 2, 10 ; CIII, 16 ; M I, 376, fragment) ;

elephant-tiger-rhinoceros-buffalo (M II, 420) ;

gharial-three fishes-tortoise (three-edged amulet, M II, C I, 2-3).

1.3. The scenes are mostly found on the amulets and sometimes on the seals. Various types of human figures, animals, plants and objects are depicted on them. Separate scenes, isolated figures and emblems are sometimes combined on one or on different edges of a single amulet.

Some scenes can be combined in a series because the same personages figure in them (tigress, buffalo, god on throne, goddess inside the tree). These series of scenes probably are a mythical concept of their kind.

2.0. The tree which has been most frequently depicted on the seals and amulets has been identified as *Ficus religiosa* (Sanskrit—*aśvattha—pippala*). Arrangement of the branches of *aśvattha*, its heart-shaped leaves with sharp ends and clearly visible veins are peculiar to it. Its branches grow in all directions (the most noteworthy are the lower branches trailing downwards).

On seal M I, 387, the aśvattha is depicted with four side-branches and a smaller branch emanating from each of them. Two trailing branches are emerging from the lower part of the trunk. Over the roots is depicted a circle with eight dots arranged in concentric order surrounding the central one. From the circle are issuing two heads of "unicorns" with long necks. On the impression of seal No. 36 (Mackay, 1943) are depicted two human figures holding the trunk under an aśvattha having four branches.

In a number of cases, the aśvattha is depicted with two trunks, with a female figure standing between them (*e.g.* M II, 430). In such cases the figure of aśvattha has been stylized, taking the form of an arch (*e.g.* H. 307, 317). Apparently, the aśvattha (according to Gadd, 1932, p. 196—palm) has been depicted in a scene on the Proto-Indian seal found in the tomb of the king Bur-Sin (city of Ur). Besides this, aśvattha and its leaves are often painted on the Proto-Indian pottery.

2.1. In the relics of the Vedic and post-Vedic period, aśvattha is a Tree of Universe, under which in the third, the highest sky, the gods sit. Almost unknown in the Rig Veda, in the Atharva Veda, it is mentioned as a tree in the sky under which the gods assemble together (the still later name is " deva sadana aśvattha "). In the Epic, the aśvattha figures as a Universal Tree (cf. the flood—myth, Mbh. III, 188, 89 ; Bhagavadgita, XVI).

The aśvattha is looked upon as the abode of the gods of the Hindu Trinity and as a symbol of the Godhead ; yakshas and nagas residing in it were adored as gods. It is considered as a tree of feminine sex and often figures as the wife of the banyan tree in the marriage ceremony of the trees.

The view expressed by Monier-Williams that aśvattha appears as the husband of the banyan tree (Monier-Williams, 1876, p. 42)

is, apparently, not correct and it is one of the examples of mixing-up of aśvattha with banyan which is perhaps explained by the conditions of growth of these trees—very often aśvattha and banyan get closely interlaced and also by their botanical relationship.

The mixing of aśvattha and banyan is a very common phenomenon both in Indian literature and fine arts. This fact has been reflected in mythology also in Hinduism both aśvattha and banyan tree are considered as the sacred trees of Vishnu. It is noteworthy that in Buddhist art, the Bodhi Tree is always depicted in the form of aśvattha, although it is well-known that the tree at Bodh Gaya (Patna city) is actually banyan tree, the remains of which are preserved even now and under which, according to Buddhist tradition, the Buddha attained enlightenment.

The aśvattha is regarded as a sacred tree right upto the present times and is considered as the abode of the deities. It is believed that its branches possess magical powers to keep off the evil spirits and its leaves help in fulfilling various desires (of wealth, male progeny etc.). It is also considered as a dangerous tree which should not grow near the house and nobody should touch it, the ladies must do parikramā of it several times in a day. The aśvattha is worshipped every Thursday in the month of Śrāvaṇa (July-August).

In South India circumambulations and offerings of various things are made by many Hindu women on those Mondays on which the new-moon falls (G. Rao, vol. I, p. II, p. 15).

The aśvattha is considered to be the sacred tree of the Jupiter planet and thereby of the fourth day of the week *i.e.*, Thursday: the traditional emblem of Jupiter and Thursday is the lotus-shaped leaf.

The cult of the aśvattha tree was extremely popular among the Dravidians. In South India the tree is surrounded by a special platform in front of which shoes are taken off and bows are given. A special role of this tree is to be pointed out in connection with marriage ceremonies in South India. A special ritual of worshipping aśvattha is an obligatory part of marriage ceremonies among some agricultural castes of Telugu (Thurston, 1907, p. 39–40). It is preferable that the posts of the marriage booth were of the pipal tree (E. Thurston, p. 43) or at least the marriage platform must contain a branch of this tree (Diehl, p. 188). There is a belief that a childless couple may obtain male offspring if they perform a marriage of Ficus Religiosa and Nim (Thurston, v. VI, p. 245).

The great importance of the aśvattha cult in the religious ideas of Dravidians since the ancient times is proved by the fact that a number of Dravidian gotras bear the local names of the Ficus Religiosa (Thurston, v. I-VI).

2.2. As the tree of Universe, knowledge or desire (Kalpataru, kalpa-vṛiksha) the aśvattha is often depicted in art. The most widespread depiction of aśvattha as the "tree of desires" is—one central branch and four side branches (Bosch, 1960, Pl. 22b); one central branch and four side branches growing from the root (ibid., Pl. 23b). In literature, the aśvattha is always described as having four or five branches and never two or three (Bosch, 1960, p. 76).

According to the notions of the Buddhist and Hindu cosmography, there are four main and eight intermediate directions, and also zenith and nadir. The four side branches in the depiction of aśvattha, on the seal No. 387 apparently correspond to the four main directions, the central branch corresponds to zenith and roots to nadir. The four additional branches apparently, correspond to the intermediate directions.

2.3. Two "unicorn" heads branch off from the trunk of aśvattha pictured on the above-mentioned seal. A chance to frame a hypothesis of considering the Proto-Indian "unicorn" a Sun deity should be discussed here. The 'unicorn", most frequently depicted on the Proto-Indian seals, in identified as urus bull, Bos primigenius (M I, 326). The urus, as well as the other bull species in different cosmogonic systems is often associated with the Sun. It should be pointed out that at least on two "unicorn" seals (H. No. 130, 141) the animal has the sign of the wheel on its side, which is the universal emblem of the Sun. The practice of bull-branding was used in India from times immemorial and exists there up to the present time. Among different emblems the marks of the Sun-wheel of Vishnu was often applied. F.e. one can bring forward the custom of some ethnic groups of Southern India to set free a bull as a scape-goat having first stamped it with the mark of the Vishnu-wheel or the trident of Shiva at śrāddha (Padfield, p. 208). The Bhils as well brand their cattle with the same marks (Koppers, Jungblut, p. 650).

By using different data of later Indian mythology and iconography we can get some principle evidence to the solar theory of the Proto-Indian "unicorn". Thus among the avataras of the solar deity, one of the 12 Adityas, Vishnu the original Sources quote

a rare avatara that of Ṛṣabha (bull)—(Bhagavatapurana, after Banerjea, p. 391). The other rare avatara of Viṣṇu, *i.e.*, ekaśṛingatanu (Skt. " having a body with one horn ", Satwata Samhita, after Banerjea, p. 392) the same as the epithet of Vishnu " ekaśṛinga " seems to be even more close—to the Proto-Indian " unicorn ", however another animal, the rhinoceros could have served as a prototype for this avatara as well. Later on this popular among the Proto-Indians symbol of the Sun-bull could have been replaced by some other animal. If we turn to later Indian tradition the horse proves to symbolize the Sun. It may be supposed that it was the Aryan Sun-horse that replaced the Proto-Indian urus. The horse itself as well as its worship was introduced into India by the Aryans. By their arrival in India they have established their own ancient horse-worship and its corresponding mythology. No wonder therefore that in the process of intercourse between the Proto-Indian and Aryan culture the Aryan Sun-deity moving across the skies in a chariot driven by horses could have annihilated the Proto-Indian urus. In this connection we should point out that Vishnu was worshipped in the form of a horse as well : Kalki avatara (Mbh.), haya-śiras (" horse-headed ", Mbh. XII).

The hypothesis of the Urus being replaced by the horse can be testified by the origin of the term " aśvattha ". The subject depicted on the Proto-Indian seal (M I,387) throws light upon the link between the horse and the Universal Tree which can be hardly explained from the point of view of later Indian tradition. It should be emphasized that the name of the horse in many Indian languages sometimes coincides with the names of the bull and other quadruped animals (Skt. haya " horse ; yak, Bos grumiens " ; Ta. mā " bull, buffalo, horse " etc.).

2.4. If the Proto-Indian " unicorn " actually symbolizes the Sun the two " unicorn " heads on the seal under consideration can be compared with the later twin-gods Aśvins (" horse-men ") the assistants of the Sun. In Sanskrit source-books (f.i. Āgamas) they are described as men having horse—heads and placed on both sides at the feet of Surya. Sometimes the Asvins were pictured at the trunk of the Universal Tree as two animals on its sides (Bosch, 1960, Pl. 17 ; Pl 66–68) or at both sides at the feet of Surya (Rao, v. I, p. II, pl. XC, fig. 3).

The symbol of this seal representing a circle with eight concentric dots around the central dot can be found among the symbols of punch-marked coins (J. Allan, p. 166). In later iconography

this symbol is sometimes pictured on the image of Devi (E. Moor, Pl 38). Probably this symbol can be interpreted as a scheme of orbis terrarum with eight directions. Its contamination with aśvattha emphasizes the fact that the tree on the seal is the Universal Tree.

On the whole the scene on the seal may be interpreted as a symbol or a record of the cosmographic ideas of the Indus Valley inhabitants.

3.0. The Hindu tradition of identification of four main and four intermediate directions with particular gods has been most clearly expressed in the Puranas. In consonance with this tradition, the eight gods of the Hindu pantheon are grouped separately as "Loka-pālas". These gods of direction are east—Indra, the god of skies, vāhana, elephant; south-east—Agni, the god of fire, vāhana, ram; south—Yama, the god of death, vāhana, buffalo; south-west—Nirriti (sometimes Sūrya "Sun"), vāhana, horse; west—Varuṇa, the god of firmament and also of water, vāhana, makara, a mythical animal; north-west—Vāyu, the god of wind (sometimes known as Marut, Pavana), vāhana, fellow deer; north—Kubera, the god of riches; north-east Īśana (one of the names of the god of storm and hurricanes, Rudra), vāhana, bull.

The idea of identifying gods with directions developed particularly in Buddhism, which distinguishes several groups symbolizing the cardinal points.

The group of gods, known as "Dik-palas" exactly corresponds to the above-mentioned "Lok-palas" of the Hindu pantheon: east—Indra, vāhana, elephant; south—Yama, vāhana, buffalo; west—Varuṇa, vāhana, crocodile; north—Kubera, vāhana, man; north-east—Īśana, vāhana, bull; south-east—Agni, vāhana, ram; south-west—Nirriti, vāhana, man; north-west—Vāyu, vāhana, fellow deer.

One of the forms of the god Mahākāla, the Mahādeva (Siva) of the Hindus, is also connected with the directions of the cardinal points. In Sadhana (a Buddhist literary work containing instructions for the worship of the Buddhist gods), it is written that Mahākāla must be surrounded by seven goddesses—three in the main directions of the cardinal points (the fourth being occupied by his own Sakti) and four others—in four corners. In the east, Mahāmāya, the wife of Maheśvara, seated on a lion: in the south Yamaduti, on a buffalo; in the north-west Kaladuti, on a horse. The following goddesses occupy the four corners: north-east—

Kalika ; south-west—Charika ; north-west—Chandreśvari ; north-east—Kuliśesvari. The vāhana of each of these goddesses is human body (Bhattacharya, 1958, pp. 346–347).

The next group of Buddhist gods, connected with directions are the five Dhyāni Buddhas who are considered to be the most ancient gods of the Buddhist pantheon, the ancestors of all the gods. One of them, the Dhyāni Buddha Vairochana (Sanskrit, Sun) symbolizes the Universe and four other Dhyāni Buddhas symbolize the four main directions : west—Amitabha, vāhana, two peacocks ; east—Akshyobhya, vāhana, two elephants ; centre (Universe)—Vairochana, vāhana, two dragons or griffins ; north—Amoghasiddhi, vāhana, two garudas (mythical birds) ; south—Ratnasambhava, vāhana, two lions. The intermediate directions in this group of gods are accompanied by the Śaktis of the above-mentioned gods of the main directions.

In the Buddhist work Nispannayogavali Tantra one more group of Buddhist gods of directions is described in detail. It consists of ten gods—four gods of the main directions, four of intermediate and two gods symbolizing zenith and nadir.

In Nispannayogavali Tantra, there is description of a special group of Buddhist goddesses, which are also related to the four main and four intermediate directions. These goddesses occupy a definite place in the Mandala. The names of the four main goddesses correspond to those animals whose faces are found in their pictures : east—Hayasya with the face of a horse, south—Sukrasya, with a pig's face, west—Svanasya, with a dog's face and north—Simhasya, with a lion's face.

To these four principal goddesses are added four more goddesses with heads of birds, corresponding to four intermediate directions : Kakasya—with a crow's head, Garudasya—with Garuda's head, Gridhrasya—with griffin (valture's) head, Ulukasya—with an owl's head. Sometimes these goddesses are depicted with human faces, and in such cases the corresponding animal has been shown separately, over the head or in the crown.

3.1. The animals which are the vahanas of the corresponding gods of directions, are divided according to the cardinal points in the following way :

Groups of Gods Cardinal points	Lokapāla	Dikpāla	Dhyāni-Buddha	Mahākāla	Goddesses with animal faces
(1)	(2)	(3)	(4)	(5)	(6)
East	Elephant	Elephant	Elephant	Lion	Horse
South	Buffalo	Buffalo	Lion	Buffalo	Swine
West	Makara	Crocodile	Peacock	Horse	Dog
North	..	Man	Garuḍa	Sākti of Mahadeva	Lion
South-east	Ram	Ram	..	..	..
South-west	Horse	Man	Sákti of the god of the East	Human body	Crow gryphon
North-west	Fallow-deer	Fallow-deer	Sákti of the god of the West	..	owl
North-east	Bull	Bull	Sákti of the god of the North		Garuḍa

The animals depicted in the polytherions symbolize, apparently, the main and intermediate directions : the elephant is connected only with east ; buffalo only with south ; bull only with north-east ; the " unicorn ", was later perhaps replaced by horse, which is connected with south-west. Tiger, in later tradition has been replaced by lion (the tiger not known in Rig Veda, occupies in Atharva Veda the place of the lion of Rig Veda) ; it was the vāhana of Mahādeva's Sákti, connected with north. In various groups of Buddhist gods of directions, the lion is connected with north, east and south.

Rhinoceros, perhaps, corresponds to west, which has no definite animal in later traditions (in Hinduism it is makara, a mythical fish with the head of a fellow deer and legs of an antelope ; in Buddhism it is crocodile, peacock, horse, dog).

Rhinoceros is not to be found as a vāhana of the gods. It could have been that the Proto-Indian word used for " rhinoceros " and also for " man " (compare the analogous word in Tamil— kaṇṭaṉ " man ", " male " and also " rhinoceros ") was borrowed in Sanskrit as a translation loan not in its first meaning (rhinoceros), but in its second meaning (" man ") and is translated into Sanskrit as Nara, meaning " husband ", " male ", " hero ".

Thus the animals depicted in the polytherions possibly reflect the cosmogonic beliefs of the Proto-Indians. The presence of the gharial with a fish (or of a fish alone) and the bird among these animals can be considered a supplement to the cosmogonic subject of these scenes. The appearance of the " unicorn " occupying the central place in the whole composition is in conformity with tradition. Similar arrangement of gods of cardinal points the sun being placed in the centre are characteristic of later Indian iconography. *E.g.* : in Buddhism one should recalled the five Dhyāni Buddhas, the earliest gods of the Pantheon. One of them, Dhyāni Buddha Vairochana (Skt. " solar ") symbolizes the Universe,. the Sun and in Mandala he occupies the centre. The other four Dhyāni Buddhas corresponding to four cardinal points should be placed arround him.

3.2. The suggested interpretation of the polytherions gives an opportunity to discuss the problem of the function of the objects themselves.

Apparently, these objects may be treated as protective amulets, preventing danger, which can come from any quarter. Worshipping of cardinal points is a characteristic feature of the Indian ritual from ancient times up to the present day. Sacrifices to gods of quarters were made while various rituals were performed. Among everyday rituals of Buddhists, for instance, morning worship of General Quarters of Earth and sky—East, South, West, North, above and below is obligatory up to the present day (de Bary, p. 123).

While studying the Proto-Indian objects mention should be made of the so-called cakkram or yantra, most widely spread in South India. They are engraved metal plates enclosed in a metal cylinder and tied by a thread round the neck of females or waist or arm of men. The figures on this protective amulets should possess the symbols of life, the eyes, tongue, eight cardinal points of the compass and the five elements (Diehl, p. 181).

The symbols on amulets may be combined in different ways on one or both order of the amulet. *E.g.*, Tamil children sometimes wear small flat copper plates (takudu) squares with figures engraved in each of them, resembling the Tamil numerals 9, 10, 11, 12.

The other side bears a circle, divided into eight segments with one Tamil letter in each. It is supposed that this amulet protects its owner from diseases and often calamities having powers to appear from any of the eight quarters (Thurston, vol. 6, p. 114).

4.0. On seal M II, 420 is depicted a three-faced human being, sitting in Yoga-mudra (ithyphallic) on a low throne, the knees widely separated apart and the soles of the feet put together with fingers downwards. The hands are partly downwards and it is touching the knees with palms, with the thumbs stretched forward. The dress includes a belt and a triangular pendant. On the head is a fan-shaped head-dress with the horns of a buffalo. In each arm—from shoulder to the wrist—there are three big and eight small bracelets, each big bracelet after four small ones.

On the left side below, is a tigress with paws stretched forward towards the multi-faced god ; on the top is an elephant, on the right—a rhinoceros and buffalo with their heads turned to the left. Before the throne are seated two antelopes, head to head, looking across the shoulders.

On seal M II, 222 is depicted a similar figure in a similar pose and dress, but single-faces, sitting on a low throne ; the head-dress is horns and a branch. A similar figure, seated on a throne, is depicted on amulets (M I, 1931, Pl. CXVI, 29; CXVIII, 11; M IV, 1938, CII, 9). On the sides there are worshippers (one of them holding a cup in his hand) and cobras standing on their tails.

4.1. The multi-faced figure on the seal M II, 420 is compared with Mahādeva of the Hindu pantheon (according to Marshall, 1931, I, p. 54, Siva in the form of Paśupati, the Lord of the Animals).

The four animals surrounding the god, as mentioned above, are associated with four cardinal points. In this case it was kept in view to depict the sovereign god of the quarters, *i.e.*, the God of the Universe.

The composition of the scene depicted on the seal has a peculiarity of its own : here we can see two scenes. One is a deity sitting on a throne with two antelopes at the bottom, the other is four animals shown symmetrically in pairs one above the other. These animals, though surrounding the deity, are shown as if they were independent of him. In other words, these are amulets with polyterions where groups of animals often appear in rows one after the other but arranged somewhat differently or joined with the image of a deity. It should be noted that two of the animals are turned away from the deity, which could have hardly been possible, if they meant to show the " Lord of animals ".

The depiction of tigress differs sharply from three other animals in its dynamic pose and orientation. One should keep in mind however that in Indian mythology tigress is associated with the vāhana of the Śakti of Mahadeva.

4.2. It is quite possible that the multi-faced figure on the seal M II, 420 is an imitation of the four-faced god, whose faces symbolize the cardinal points. Orientation of the multi-faced gods according to the cardinal points is peculiar to the Hindu iconography. Multi-faced images were characteristic of Mahadeva as well.

According to Vishnudharmottara (Book III, Ch. 48, 4 8) four faces of Siva correspond to four main directions: East (Mahadeva face), South (Bhaírava face), West (Nandivaktra face) and North (Umavaktra face): the fifth face, placed above the other four is Sadaśíva face (or Īśana) symbolizing vyoma or akaśa (after Banerjea, p. 573).

This allows D. N. Banerjea to identify even the famous Trimurti sculpture of Elephanta with the four-faced Siva. His interpretation is as follows: the central face of the sculpture corresponds to the East (according to the east orientation of the temple itself), the face to the right corresponds to the South (its terrific character reflects its mythological name Bhaírava), the left face is the North. The West face is absent because of the sculpture is flat (Banerjea, p. 574).

A rather unique sculpture of Siva belonging to the late Pallava period (about VIII b.c.) should be mentioned here: a three-faced god (the central face of terrific character) is sitting in a Yoga-mudra (G. Rao, v II, p. II, pp. 380–382, Place CXIV, fig. 1).

4.3. On seal Ch. 43 is depicted a bull with a human face, cohabiting with a supine goddess having a branch on her head (according to Mackay, 1943, p. 147 'a bull trampling man'). In Hindu pantheon, the bull is associated with the vāhana of Mahādeva. In a number of instances Mahādeva himself appears in the form of a bull. The goddess with a branch on the head, obviously, is the Śakti of Mahādeva.

5.0. On a number of seals and amulets is depicted a naked goddess standing inside an aśvattha tree, having horned head-dress and with bracelets on her hands. There is a human figure standing before her, also in horned head-dress in a pose of adoration; behind it (sometimes in the front) is standing a he-goat with a human face and a small table with offerings on it.

The goddess having horns and branches on its head and standing inside a tree is also depicted separately, and the tree has been depicted in a number of cases in the stylized form of an arch, (H. 307, 317 etc.).

Obviously the tradition of placing the image of a deity within the arch, styled like a tree, so widely spread in the late Indian iconography, goes back to the Proto-Indian art. This ' arch ' is a characteristic feature of many Hindu images. One may refer to numerous representations of the sakti of Mahadeva as to the nearest parallels of the Proto-Indian pictures of the ' goddess in a tree ' (G. Rao, v. II, pt. I, pl. XLIX ; Moor, 1810, table 12).

Mahadeva himself, particularly in the form of Nataraja performing a cosmic dance (a popular deity of South India) was also represented within such arch, which is usually treated as the symbol of the Universe, while the leaf-like figures, arranged symmetrically along the arch are supposed to be the flames.

5.1. In a number of scenes the offerings to the " goddess in a free " are accompanied by seven or six female figures, with oblique hemming of their dress and having branches (?) on head.

The seven (in the Mohenjo-daro variants of scale) or six (in the Harappa seal-variants) female figures, accompanying the goddess are compared with the Goddesses of Seven Rivers (Sanskrit, Saptasindhu). Sarasvati was considered the chief among the goddesses of the Seven Rivers and in the Vedas it was named " the mother of rivers " (Skt. Sindhumatri) ; ' having seven sisters ' (Skt. Saptasvaśri).

In the source-books on ancient India, various rivers, including the Indus, were called by name Sarasvati (the traditional sacred river, known to Avesta also).

It is quite possible to identify the Harappan version of the goddess inside the tree and six " sisters " with the seven rivers of Punjab, and the Mohenjo-daro version of the goddess and seven ' sisters ' can be identified with the river Indus and its seven tributaries (which include the Indus also upto its confluence with the other rivers).

It is not surprising that in Sanskrit Source-books one and the same Sanskrit term plaksha is used to denote some trees of a genus Fiens (among them the aśvatha) and as one of the names of the river Sarasvati (Mahabharata, Harivanska). In Mahabharata there

is a derivative word plakshajata (" rising from aśvattha "), which is used for the name of the river Sarasvati (Mahabharata, I, 6455, after S. Sörensen, p. 552).

5.2. The cult of Seven (sometimes, eight) Goddesses is widely represented in all the religious systems of India. In the Vedas, they are seven apsaras (Saptapsaras), water nymphs, Goddesses of Rivers (there are some evidences of the identification of apsaras with rivers as early as in Rig Veda: V. 41, 19; VII, 33, 9). Apsaras and their mythological husbands Gandharvas are worshipped in the Vedas as the gods of fertility. The Atharva Veda shows to the permanent connection of apsaras with water: rivers, clouds, lightning, as well as stars. Apsaras and Gandharvas dwell in trees, mostly in aśvattha and banyan. They are appealed to for a blessing during marriage ceremonies (Keith, p. 84–96).

In Brahmanism and Hinduism it is the cult of seven Mother Goddesses (Saptamatrikas), in Jainism it is the cult of the goddesses Ambika (Kuśmandini, the Jain Durga), who in Jain iconography appears accompanied by seven dancing female figures (Banerjea, p. 563).

According to the myths related in the Puranas and Agamas, the seven Mother Goddesses were created by Siva to help him in his fight against the Asuras. There are some versions of this myth indicating the close connection of the cult of seven Mother Goddesses with Siva and his son Skanda.

The same sources give the names of the goddesses: (i) Brahmani, the sakti of Brahma; (ii) Mahesvari, the sakti of Mahesvara, (iii) Kaumari, the sakti of Kumara (Skanda), (iv) Vaishnavi, the sakti of Vishnu; (v) Varahi, the sakti of Varaha, (vi) Indrani, the sakti of Indra, (vii) Chamundi, the sakti of Yama. The Varahapurana adds the eighth goddess Yogeśvari, to the seven enumerated above.

The cult of Seven Goddesses is widely spread in South India, particularly, among the Tamils, the Kanara, who worship seven Sister Goddesses (māri). Sometimes these goddesses are treated as Siva's wives or sisters (Whitehead, 1921, p. 29).

When a married couple are anxious to have female offspring, they take a vow to offer figures of the Seven Virgins (Sapta Kaṉṉimar) who are represented all seated in a row (Thurston, Omens and Superstitions of Southern India, p. 166).

It is to be pointed out that the cult of Earth Goddesses, very popular up to the present day among the Dravidian tribes of Central India, is connected with worship of the Sal tree (Shorea robusta) which controlls rain, the Korvas offer flowers and goats to the goddess dwelling under this tree: the Ghasia sacrifice sheep or goats (W. Crooke, vol. I, p. 30-32).

5.3. According to detailed descriptions in Agamas, Saptamatrikas were represented as seven female figures seated in a row with different attributes in their hands. Such representations of these goddesses survived in Ellora (G. Rao, v. I, p. II, pl. CXVIII, fig. 1).

The images known to us do not reflect the prescriptions of canonical literature to place the images of seven Mother-Goddesses under the trees, with one particular tree corresponding to each godess: Brahmani—under Palasa tree, Vaishnavi—under raja-vriksha, Indranai—under Kalpaka tree, Chamundi—under fig-tree, Kaumari—under Adumbara or fig-tree. These trees were considered to be dwelling places of respective goddesses (G. Rao, v. I, p. II, p. 383-389).

The images of Saptamatrikas, as well as of apsaras, are rather rare. In addition to the mentioned above, we can indicate the images of apsaras on the Bharhut Stupa (1754 c.): seven female figures arranged in one row (Zimmer, fig. 46).

Seven female figures arranged in one row are depicted on a rude piece of embossed copper published by E. Moor (pl. 34, fig. 3). He identifies this seven female figures with seven apsaras, presiding over water and invoked for supplies to rivers, tanks and wells, on which occasion sheep are sometimes sacrificed to them (ibid., p. 163).

In general, if we turn to the Hindu iconography, we can notice that frequently the traditional images of Goddesses of Rivers can hardly be distinguished from those of Devi (including her various forms: Parvati, Lakshmi, Sarasvati etc.).

5.4. The Proto-Indian sign 5 representing a female goddess with uplifted hands evidently denotes a female deity.

One of the epithets of the goddess with the uplifted hands is expressed by the sign 41. The same sign with the numeral seven preceding it (YII-41) constitutes a block which renders the name of the seven female personages accompanying " the goddess in the tree ".

The block YII-4I can be found on the trihedral amulet (M II, Cl, 7) accompanying the block 29-5 (presumably the name of the Great Goddess). Other amulets of this type bear scenes and figures including the image representing the goddess in the tree. The image of this goddess is accompanied sometimes by seven female personages (for example M II, 430). On the amulet M II, CI, 7 the figures and scenes are replaced by the inscriptions. It is possible therefore that the block YII-4I found in combination with the name of a goddess could render the denomination of these seven females (the sign probably a representation of the rainbow, skt. Indran dhanus, cāpa).

As it is mentioned earlier the seven female personages may be compared with the goddesses of the Seven Rivers as well as with the seven apsaras. The apsaras are sometimes regarded as personifications of the rainbow. The Sanskrit word vidyut-prabha used in the Mahābhārata to denote the apsaras is sometimes interpreted as " shining like a lightning or rainbow " or " originating from the lightning or rainbow ".

Apparently, the block YII-4I may be interpreted as " seven rainbows " (the rainbow consists of seven distinct colours) or " seven apsaras " and represents the designation of the seven female personages accompanying " the goddess in the tree ".

The block 41-5 probably represents the name of the " rainbow goddess ".

6.0. On seal No. 510 (M, 1938) is depicted a buffalo; five naked female figures are jumping over it from the tail towards the head (according to Marshall, 1931, I, buffalo, in this scene appears as the Vāhana of Yama, the God of Death, killing people).

In some other scenes, the killing of buffalo has been depicted. The human figure is attacking the face of the buffalo with his left leg, holding its right horn with his left hands and with his right hand striking on the back of the neck with a spear. A tree and three female figures are depicted on the right (M II, Pl. XCI, 4). In the scene depicted on the seal M II, 279; XCII, 11 one finds a personage slaying a buffalo with his spear. The scene has its near parallel in the Sumerian myth about battle of Gilgamesh and the Heavenly bull, usually represented as a buffalo.

An evident parallel to this scene is found in an episode from the late Indian mythology of the killing of the demon-buffalo Mahiṣa. This motif has many variants in the ancient Sanskrit

monuments. The feat of killing Mahiṣa is ascribed to several deities, Skanda among them. According to the myth related in the Mahābhārata, Skanda appeared in this world in order to head the army of the gods in their struggle against various demons. Among other demons slain by Skanda one finds Mahiṣa (MBH III, 231, 90–97). Some details given in the Mahābhārata's version of "Mahiṣamardana" (the killing of Mahiṣa) correspond to the scene on the Proto-Indian seal.

Skanda is a warrior, a god of war, Siva's general in the war against the enemies of the gods. He is known under many names and has many iconographic variants. He may hold various attributes in his hands, one of which—a spear—being obligatory for any representation of Skanda. The spear may assume different forms. The Sanskrit names of Skanda Śaktyayudha, Śaktidhara describes him as a spear-bearer. Various epithets of Skanda with the general meaning of 'spear-bearer' are widely used in the Dravidian literature as well.

The Proto-Indian sign—a personage with a spear in his hand (7) evidently corresponds to the personage with a spear, depicted in the scenes on the above mentioned Proto-Indian seals.

The personage with a spear in his hand has direct analogies among the signs found on the punch-marked coins. It is interpreted as Skanda (Cunningham, Allan).

7.0. The Proto-Indian figures include personages which have pictorial correspondences among the signs of the Proto-Indian inscriptions. Thus, an impression from a trihedral object (H 305) depicts a male personage with a stick on his shoulder and the sign (31) at his feet; this personage corresponds to the sign (12) from the inscriptions.

The same personage is depicted on an ivory plaque found in the upper level of Mohenjo-Daro (Marshall, 1931, pl. CXXXII, 10). This personage carries in his right hand an object which can be identified as a stick or a club (Marshall considers it a bow or a quiver of arrows, though compares this personage with the sign (12), v. II, p. 562).

The same curious position of the arms seen in many figures from the archaic seals from Susa has been noted by J. Marshall (ibid.). In addition to that similar male terracotta figurines of El-Ubaid period can be mentioned here (Lloyd, Safar, 1948, v. IV, p. 118).

7.1. The images of deities with the stick on the shoulder were retained in the late Indian iconography (Wilkins, 1882, p. 67). Thus, in such a posture is sometimes represented the god Yama (as a number of other gods—Bhairava, etc.).

This iconographic feature of Yama is reflected in Sanskrit where he has the constant epithet of "daṇḍin"—"daṇḍadhara" 'carrying or holding the club'.

There is a rather unique image of a bull-faced human being with a club (daṅḍa) on his right shoulder and a noose (pasa) in his left hand (G. Rao, 1914—, v. I, p. II, pl. CXXII; CXXIII pp. 391–396), represented in a half relief at Tirupparangunṟam temple near Madura (VIII c. A.D.). This deity is placed at the right side of the central female deity identified by G. Rao as Jyeṣtihadevi (the "Elder Goddess"—a goddess of misfortune, very popular among the Dravidians of South India). The bull-faced deity of this half relief is not identified by G. Rao. It seems possible to compare this image with the canonic descriptions and images of the god Yama, riding a buffalo and usually represented with his traditional attributes the club (daṅḍa) and the noose (pasa).

It should be pointed out that both the Proto-Indian personage from the trihedral object and the South Indian personage under consideration occupy the side position in a group of three personages.

It is possible, that both the figure on the trihedral object and the corresponding sign (12) denote a deity which—in some aspects—could be regarded as one of the "predecessors" of Vedic Yama or some other god with analogous functions. Significantly, on some Proto-Indian burial vessels there are depicted the figures of dogs (dog are attended to Yama, as a god of death).

8. A flying bird with the head turned to the left is depicted on the obverse of the two-sided seal H 225. Two snakes are placed above the spread wings; there are mountain symbols on the sides below. The reverse bears a cross.

M. Vats compares this bird with the sun bird Garuḍa, the vahana of Vishnu. Such an interpretation is quite appropriate and may be supported mythologically. The scene depicted on the seal may be interpreted in terms of the myth about Garuḍa and the snakes (the sons of Vinata and Kadru, two sisters, from one common father Kaśyapa—the Polar Star) which was widely known in ancient India.

Such an interpretation of the scene from the seal is supported by the presence of the mountain sign, a detail disregarded by M. Vats. The figures of two mountains on the sides of Garuḍa which itself symbolises the sun may be interpreted as an indication of the sunrise and sunset.

In an Indian epigraphic monument dated by the XI century A.D. (F. Kielhorn, "Deopara Inscription of Vijayasena", EI, I, p. 310) the following detail is present in the description of the cosmic Meru mountain : there are two mountains - Udaya-giri and Asta-giri - where "the celestial star (sun) dwells when it rises or sets" (quoted after Bosch, 1960, p. 142).

The earliest representation of Garuda appears to be the figure of a bird engraved among other animals (near a five-head snake) on the eastern gate of the stupa in Sanci. In the art of Gandhara Garuda was depicted as a mighty eagle. In the Gupta period Garuda was portrayed on golden and silver coins and on column capitals. Garuda was, apparently, the royal emblem of the Gupta rulers and was represented as a huge bird with the spread wings.

In the Proto-Indian texts the name of Garuda is probably represented by the sign of a flying bird (19) with the preceding epithet.

9. Among the Proto-Indian signs there is one (44) that may be named "a man with a spiral". Though the spiral is absent from the pictures on the seals and amulets the symbol is repeated in the form of several clay objects which are identified by E. Mackay as cake moulds (M II, Pl. CV, 45 ; CVII, 45 : CIX, 1, 2). While describing these moulds E. Mackay suggests that a shell could be used in making such pottery moulds (due to regularity of its spiral (E. Mackay, vol. I, p. 424). Such moulds are used nowadays in the Madras Presidency for the so-called "Nilgiri pancakes". (ibid.).

It is possible to compare the sign (44) with the śankha—an attribute of Vishnu - widely spread in later Indian Iconography. Being typical of Vishnu the śankha is sometimes placed in the hands of some other gods. The spiral lines are characteristic of many representations of this attribute. Among the iconographic variations of śankha there is one almost similar to the Proto-Indian sign (Moor, 1810, Pl. 42, fig. 1). One more sacred object can be mentioned here, *i.e.*, the salagrama. It is an ammonite found in the Gandak river and valued more or less highly by Vaishnavas according to the number of its spirals and perforations (Dowson, 1953, 275).

10. The Proto-Indian texts include stable combinations of the signs with numerals. These combinations form a special group of blocks. The presence of a large group of words and word combinations with a numeral as the first component is also very characteristic of Sanskrit. The numbers three, four and seven are the likeliest first components in the Sanskrit (as well as in the Proto-Indian) combinations of this type. This group of vocabulary in Sanskrit as a rule is semantically related to mythology and renders mainly the names and epithets of the gods and other mythological personages as well as the names of different objects mainly connected with religion and ritual. Thus the block (iii—30) (" three fences ") could be regarded on analogy with the Sanskrit stable combinations " tri-pura ", the name of fabulous city Tripura destroyed by Siva.

11. The block (20–5) may be interpreted as " the shining or luminous goddess " (mín ' fish ' in the Dravidian languages may, as has already been noted, mean ' fish ', ' star ', as well as ' to shine ', ' to sparkle ', ' to glitter ').

In the Mahabharata, the Laws of Manu and other monuments one comes across a personification of the sun's spouse Prabhā. Sometimes she appears as the mother of the morning, noon and afternoon; or she may be identified as an apsara (in the Māhābhārata) or Durga (in Harivamśa and the Purana). Prabha—" light "—is one of the names of Parvati, Siva's wife.

The Sanskrit word Prabha is derived from the root bhā- ' to shine ', ' to beam ' and, possibly, may be interpreted by analogy with Dravidian min.

12.0. Figures are found (although not very often) already on tiny stone plates with inscriptions—the oldest discovered so far (Harappa). Later these plates are replaced by clay ones with inscriptions and figures imprinted by means of stone seals. The inscriptions and figures imprinted on the clay plates are in some cases those found on earlier stone plates.

There are many tablets on which the same seal was imprinted. In the opinion of many scholars baked clay plates, trihedral prisms and other objects were of a ritual character. Thus, E. Mackay, their first student, supposed that they served as votive offerings: possibly they were distributed by priests in the temples, or, what is more likely, they were bought from the priests as a proof of performing religious duties (Marshall, 1931, v. II, p. 397).

12.1. Some scenes on the Proto-Indian seals and amulets undoubtedly denote offerings. Such are, in the first instance, the scenes depicting adorants with a cup in hand which resemble the writing signs (31) : *e.g.*, one of the adorants holds a round-bottom vessel in a scene which depicts a deity on the throne with two kneeling adorants to the deity's right and left (M I, CXVI, 29 ; CXVIII, II ; M II, CII, 9) ; in the scene " offering to the tree " there is a kneeling adorant with a round-bottom vessel in his hand in front of the tree (M II, XC, 24).

Apart from these scenes which apparently portray a drink-offering (although, food could also be offered to the deity in the vessel) other forms of offering were depicted on the Proto-Indian objects as well.

Thus, in the scene on the seal M II, 371 " the goddess in the tree " is portrayed as well as a goat with " a human face " and a goddess in the posture of adoration. There is a sacrificial table (altar) behind her with an obscure object on it. Apparently, this scene depicts a solemn offering probably connected with a wedding ritual.

It is quite probable that a " feeding-rack " repeatedly found in front not only of the domesticated bull and buffalo but also of the elephant, rhinoceros, and tiger is related to the offering to the deity in the person of its sacred animal. The scene depicting a snake drinking from a vessel standing near a tree may be interpreted in the similar way.

12.2. It is well known that offering is the predominant form of worship in India since the earliest times. The Vedic and post-Vedic literature contains rich information on the character and form of the offering. These monuments describe the offering and prayer as the two major Vedic rituals. There are numerous indications that drink-offering was common in the Vedic and post-Vedic period, the ritual vessel thus being a prominent part of the procedure. The ritual vessel is mentioned (under different names) in early Sanskrit monuments. It was depicted in the Indian iconography as one of the attributes of some deities.

12.3. As it was noted above, the so-called " sacrificial " inscriptions contain a block, consisting of the sign (31) (representing a cup) in combination with the numerals from one to four. It is significant that in some cases the cup-sign is accompanied by little circles, probably the representation of drops. In ancient India the different types of sacrifices (especially the offerings to the god

of fire) were made not simply by pouring but by sprinkling the liquid (water, ghee, wine) into the fire.

12.4. The use of the numerals from one to four before the sign of the cup may serve as a proof of the sacrificial character of these inscriptions and indicates some possible four types of offering.

Cups appear in the Indian mythology as the vessels from which the gods are drinking. They were made by the semi-gods Ṛbhu which are sometimes regarded as the personification of three seasons (Ṛbhu, Vibhu, Vaja). The semi-gods made four cups out of one which belonged to Tvaṣṭri, the god creator and Ṛbhu's teacher in the crafts. The four cups are sometimes related to the four phases of the moon. Possibly such an interpretation of the four cups is somehow connected with the custom of a four-day offering to Soma, the moon (caturvīra), or with four kinds of the offering to the same god (catur-samstha).

Different Sanskrit monuments include information on other four-fold types of offering in old India. Thus, Apastambha Dharma-sutra relates about four offerings: Aśva (horse), Puruṣa (man), Pitri (ancestors) and Sarva (complete offering or an offering of all types). Cf. Bötlingk, 1884, v. II, p. 128 etc.

The form and contents of the offering could undoubtedly change during the extensive period which separates the Proto-Indian culture from Vedic and Post-Vedic. This, however, cannot deny a certain continuity between the Proto-Indian inscriptions consisting of the cup sign plus the numerals from one to four and the four-fold offering of the later classical religions of India.

12.5. The final block of the early inscriptions is often accompanied by the circle with a dot in the centre. Sometimes the circle or circles (from one to four) may immediately follow the first half of the inscription thus replacing the cup with the numbers. The circle with a dot apparently denoted the eye. The same circle with a dot in the centre denotes the eye in some Proto-Indian representations of the animals, *e.g.*, fish, bare or bird. This sign is also found in later epigraphic monuments.

Various Sanskrit words denoting the eye may also mean a round depression in the ground used for offerings.

It may thus be supposed that the representations of the eye (from one to four in number) found at the end of the inscriptions under examination denote some types of offering just as the "cup symbol" plus the numerals from one to four.

Towards the Linguistic Interpretation of the Proto-Indian Texts

N. V. GUROV

0. The supposition concerning the affinity of the Dravidian culture with ancient cultures of Near East and the Mediterranean, first stated as early as 1920 by J. Hornell (225–226) was maintained by many (largely, Indian) scholars, who made attempts to prove the existance of a single "Dravida-Mediterranean" cultural zone.[1] The excavations at Mohenjo-daro and Harappa, beginning in 1923–24, discovered a highly developed civilization, unknown before, referring to the 3rd-2nd millenium B.C., genetically connected with the Indian culture in its later stages of development and having much in common with the contemporary culture of Elam and early Mesopotamia. More thorough investigations, carried out under J. Marshall, E. Mackay, M. S. Vats, showed that the heritage of the Proto-Indian civilization is most pronounced in those phenomena of material and spiritual culture of India, which form the so-called "Non-Aryan" (to be more precise, Pre-Aryan) substratum and are most characteristic of the Southern area of the Indian subcontinent, inhabited by the Dravidians (Marshall, 1931, 51–56, 65, 109–110 ; Mackay, 1948 ; Wheeler, 1953, 83–84, 95).

Archaeological and ethnographical data have naturally led many scholars to draw a conclusion as to the Dravidian ethnos of the bearers of the Indus Valley civilization and the affinity of the language of Proto-Dravidian texts to the Dravidian type.

0.1. This hypothesis was held by some students of script of Mohenjo-daro and Harappa. P. Meriggi classified the language of the inhabitants of the Indus Valley as "Proto-Brahui" (Ur-Brahui Drawidisch).[2] The same point of view was asserted in the numerous works by Spanish scholar H. Heras. Defining the language of Proto-Indian inscriptions H. Heras pointed out that this language could not have been fully identical with any of the Dravidian languages existing in India at present. On the contrary, according to him it should have been "the mother-tongue of the modern Dravidian dialects, which should duly bear the name Proto-Dravidian" ("la lengua madre de las modernas lenguas dravidicas, que puede ser apelliada . . . lengua proto-dravidia". H. Heras, 1940, 10). To prove his point of view, he, for the first time in the

history of the study of the Indus Valley script, tried to make use of the affluent material on ethnography of Dravidian peoples of Southern India, their mythology, history and culture.

Although H. Heras treated most Proto-Indian texts as a continuous series of ideogrammes, whose reading is not, in fact, connected with phonology and morphological structure of any language, he however, tried to distinguish signs possessing a purely auxilliary function representing grammatical termination and syn-semantic words. He managed not only to distinguish such group of signs, but also to identify them with particular morphological complexes of the Tamil language. Some of the identifications, offered by H. Heras, are adopted (with certain reservations) by the authors of this paper (*e.g.* identification of the sign 27 as the suffix of the " Oblique case ". See H. Heras, 1940, 89). H. Heras was the first of the students of the Indus Valley script who tried to apply to Proto-Indian texts the method of " homonimical reading ". (According to this method an ideograme may convey not only the word directly connected with it but also all the words of similar phonetic appearance.)

H. Heras' attempt to decipher Proto-Indian inscriptions can hardly be considered successful in view of a number of methodological shortcomings. Trying to establish the ideographical meaning of single signs, H. Heras rather often made use of most superficial analogies with elements taken from scripts of different character and structure (Ancient Egyptian and Ancient Chinese hieroglyphs, Sumerian cuneiform etc.). This frequently led him to draw far-fetched and sometimes purely fantastic conclusions. Besides, the quality of the readings offered by him was badly affected by his lack of attention to the formal structure of the inscription, to combinatory-statistical characteristics of certain signs. Resting mostly on the indistinct drawings, H. Heras could not take into account the paleographical peculiarities of the Proto-Indian script. The result is that in his works some integral signs are treated as ligatures and—vice versa—" compound " signs appear as allographs of simple ones. The important question of direction of writing is decided by him arbitrarily and in some cases even erroneously.

It should also be emphasized that he had not sufficient data at his disposal, necessary for the correct reconstruction of the Proto-Dravidian phonological system. Most of the readings offered by him are based on Tamil materials, since, according to him, it is sufficient for the reconstruction of the Proto-Dravidian archetype " to free a Tamil word of all its suffixes and additional sounds,

which have adorned it in the course of centuries" (de todos los sufijos y consonantes con que habìa sido englanada en el curso de los siglos)[3].

Yet, in spite of his failure to decipher the writing of the Indus Valley, H. Heras' works in the field of the Proto-Indian culture deserve the closest attention, being the first attempt to compare this culture with that of the Dravidian peoples.

H. Heras' point of view and his "decipherment" was accepted by some Indian and European scholars (Gnanaprakasar ; J. Crowley, 1946 ; J. Quintana Vives, 1946-a, 1946-b etc.).

0.2. The problems of the Dravidian ethnogenesis, the possible migrations of the Ancient Dravidian tribes, the time and geographical ways of their penetration in the South Indian area were thoroughly studied by the scholars of different specialities: anthropologists, archaeologists, historians, linguists etc. The general conception, accepted by the authors of the present work, is roughly speaking as follows :

The ancestors of Dravidian speaking bearers of Proto-Indian culture lived, apparently, North of India, in the areas around the Caspian Sea. They might have come in contact with the neighbouring tribes, resulting in definite correspondences among Dravidian and Uralian (Finno-Ugric) languages. (Cf. Caldwell 1856 ; Schrader 1925, 1936 ; Burrow 1944 ; Andronov 1961. The considerable amount of the linguistic parallels between Dravidian and Uralian gives a very sound reason to the theory of the remote relationship of these two families.)

Later, Dravidian speaking tribes must have moved down the valleys of the Mesopotamian rivers, and then, along the shore of the Persian Gulf, came to the Indus Valley. Here they mixed with aboriginal tribes of Veddoid anthropological type speaking one of the "Vedic" languages not existing nowadays (personal communications with S. A. Arutyunov). Obviously, a certain Veddoid substratum must be present in the Proto-Indian culture and, probably, in the language of Proto-Indian texts.

The Dravidian speaking people coming to the Indus Valley might have had very much in common in culture and, probably, even in language with Pre-Sumerian population of Southern Mesopotamia (El-Obeid, Tell-as-Savan, Eridu). This explains many correspondences between Proto-Indian and Mesopotamian cultures—in addition to the later trade contacts (cf. Kramer 1964).

The tribes speaking the languages of Munda group moved to Hindustan from the Indo-China peninsular and, apparently, did not reach the Indus Valley (S. A. Arutyunov ; cf. Bongardt-Levin, Deopik 1957 ; Bongardt-Levin 1963).

Proto-Indian towns carried on extensive trade using land and maritime ways, the main base of marine trade being the Malabar coast, from where they exported valuable raw materials, using the port in the estuary of the Indus river and in Lothal as a starting point, Proto-Indian ships made regular cruises to the South along the shore.

Proto-Indian merchant factories must have been situated South of Lothal along the whole of the Malabar coast. It should be of interest to notice, that most significant trade ports of the Malabar coast had existed in the same places since the time immemorial and first mentions of them were made by Greek and Roman geographers as early as IV-III centuries B.C.—I-II cent. A.D. Regular contacts of the Proto-Indians with aboriginal tribes resulted in the extensive spreading of the Dravidian languages deep into Deccan peninsula—first, as a kind of inter-tribal languages and then as basic ones. In this case the formation of South Dravidian languages is more or less simultaneous with the development of the Proto-Indian Culture. (Curiously enough, but this conception could explain somehow the well-known Tamil legend about the " lost Lemuria " and the people of the " second Sangam " arrived to South India from this mysterious land " beyond the sea ".)

0.2.1. We should like to point out that, besides the archaeological, ethnographical and cultural data there is some evidence concerning the inner sub-grouping of the Dravidian family of languages, its historical development and geography, which could be regarded as speaking in favour of this conception. The traditional point of view was that three main Groups of languages (Northern, Central and Southern), constituting the Dravidian family, occupy three neighbouring zones of the Indian subcontinent (from North to South). The border between the Southern and Central groups more or less coincided with that of the present states Andhra, Orissa and Madhya-Pradesh and crossed the Deccan peninsula approximately in the latitude of 19°N.

As a result of investigations carried out in recent years it become clear that the Telugu and Tulu languages are typologically and materially close rather to the Central Dravidian than to the Southern group, although they were greatly influenced by the

South Dravidian environment (Krishnamurti, 1961, 237–269; Emeneau, 1967, 365 ff; Zvelebil, 1968, 4–5). Adopting this opinion, generally accepted in modern Dravidology, we are bound to state that the zone of the South Dravidian languages does not merely border on the Central zone in the South (as it was considered before) but as if cuts it into two unequal parts, one of which embraces the area of expansion of all the Central Dravidian languages (together with Telugu), the other being a comparatively small region, occupied by the bearers of the Tulu language, *viz.*, the region of Mangalore on the Western (Malabar) coast.

The geographical distribution of the branches of the Dravidian family allows us to suppose, first of all, that the Dravidian migration to India had a "wave-like" character and that the bearers of "parent languages" of the Northern, Central and Southern branches penetrated there at different times and, probably, by different ways. (This supposition does not contradict the data concerning disintegration of the single Proto-Dravidian language obtained by M. S. Andronov on the basis of lexico-statistic analysis. See, Andronov, 1964, 76–78). On the other hand, the geographical position of the South Dravidian languages allows the supposition as to the possible penetration of the South Dravidian ancestors in the Deccan from the Arabian Sea (hypothetically, in the areas of Goa-Mangalore and Calicut-Trivandrum).

Summing up, we can state that the conclusion as to the affinity of the language in Proto-Indian texts with the Dravidian family, which has been drawn by the authors of "Preliminary report" (1965, 49–51) on the basis of statistical observations, does not contradict one of the most widely spread and, from our point of view, most reasonable hypothesis concerning the language of the bearers of Harappan culture.

1.0. The data provided at present by comparative Dravidology show that the Harappa civilization chronologically coincides with the period of the single Proto-Dravidian language (Zvelebil, 1965, 375–376; cf. also Andronov, 1964, 62–79). The earliest written monuments in the Dravidian languages (Tamil Brahmi inscriptions found in 1903–1906 near Madurai and Tirunelveli) were created about III century B.C. (Mahadevan, 1968, 1–2; cf. Zvelebil, 1964, 547–549).

In our attempt to confront the Proto-Indian inscriptions with the copious data of Dravidian linguistics we are bound to proceed from genetic and typological reconstructions, based upon

the facts of "living" languages, all of them at least 1500 years "younger" than the language under study and most of them spoken in the regions hundreds of miles distant from the Indus Valley. Any "asterisked" form remains very much a matter of convention, while in the given case the sphere in which such a reconstruction can be used as well as the possibilities of its cross-checking are severely limited by, firstly, the mixed character of the writing, and, secondly, the extreme brevity of the texts coupled with very specialised contents.

Nevertheless, if one takes into account some specific factors in the historical development of the Dravidian languages, it appears to be plausible and even possible to cross such an extensive gap in space and time.

Genetic divergence in the Dravidian family has not gone as far as among, say, Indo-European or Tibeto-Burman languages. All Dravidian languages with a possible exception of Brahui developed for many centuries within rather a limited area under similar cultural and historical circumstances which could have facilitated the preservation of many common features in grammar, phonology and vocabulary.

Finally, in recent years Dravidology has made a promising advance : many new valuable materials have been published and a number of important regularities in the historical development of the Dravidian languages have been established. Now attempts at reconstructing Proto-Dravidian can be carried out on a sound linguistic footing.

1.1. The Proto-Indian inscriptions are characterised by a limited number of variable signs with a restricted distribution ("Predvaritel'noe soobšcenie", 1965, 36–37).

Any attempt to make a reliable comparison of the Proto-Indian variables (and their conjunctions) with the definite combinations of Dravidian affixes appears therefore unreasonable and even impossible. In the process of investigation of the Proto-Indian texts it is proved to be necessary to draw some additional data : the positional characteristics of the blocks and their probable semantic interpretation.

Radical blocks include a number of relatively unconventionalised signs which could thus be easily interpreted semantically. This is certainly true of stable combinations with numbers, as the latter in most cases allow unambiguous interpretations. Constantly

recurring combinations of *one* number (N) with *the same* symbol (R) are in all probability unrelated directly to quantitative enumeration of objects, but rather express a single semantic complex or a group of related notions, *i.e.*, they are " phraseological units ". Many students of the Proto-Indian culture and writing (Marshall, 1931 ; Mackay, 1938) expressed suppositions about a ritual nature or relationships of many inscriptions. It would be instructive to compile a full list of the Proto-Indian blocks which include unconventionalised signs and compare this list with that of terms and stable combinations semantically related to the conceptual field of mythology and including one common element (*e.g.*, numeral).

The sources for the second list should be looked for in the oldest monuments of the Tamil literature and epigraphics (in the first place the Tamil inscriptions in the Brahmi script and literature of the I–III centuries A.D.), the folklore and myths of the " illiterate " Dravidian peoples and, finally, the monuments of the ancient Indian (Sanskrit) epic (including the earliest puranas). The assumption is that in ancient India the composition of the rite and, consequently, the ritual terminology were remarkably stable owing to which the linguistic consciousness of the Indians and, particularly, Dravidians could retain many pre-Aryan ritual and mythological features.

In certain cases the interpretation of the radical blocks permits not only to establish the funcional value of the variable symbol following the unit, but to make definite suppositions about the meaning of the inscription as a whole by comparing it with a hypothetically identical structure of the Dravidian text (namely, standard formulas attested in the Tamil Brahmi inscriptions as well as in Tamil, Telugu, Kannada and Malayalam inscriptions of the VI–X centuries A.D.).

These assumptions are only relevant with regard to the present stage of the Proto-Indian studies and do not cover all eventual inferences from either Dravidian or Sanskrit.

1.2. Some characteristic features of the Dravidian morphology, morphonemics and syntax could determine to some extent the application of a morpheme-syllabic system of writing for a Dravidian-type language. We have in mind, first of all, the following phenomena :

(1) the morpheme combination within a word-form is characterised by weak fusion : morphonemic changes at junctures occur only in very restricted cases ;

(2) the root morpheme which occupies the initial-position in the word—form is distinctly separated from the non-root (form—and word-building) morphemes agglutinated to the former as suffixes ;[5]

(3) the root morpheme is equal in its length to the syllable ; two types of roots are distinguished : (C)V=and (C)VC=. (Krishnamurti, 1958, 260 ; Zvelebil-Glazov-Andronov, 1967, 12, 14, 95, 117) ;

(4) as the comparative studies have shown the morpheme types=CVCV=, =CCV=, =VCCV= etc. appear as a result of a contraction of two morphemes of the type =(C)V(C)= : preliminary statistics shows that monosyllabic morphemes =V(C), =(C)VC constitute a substantial proportion of the non-root (word- and form-building) morphemes in the oldest Dravidian texts (Krishnamurti, 1961, 136) ;[6]

(5) word- and form-building morphemes often receive no explicit (sound) expression, thus many words and word-forms coincide formally with the monosyllabic root morpheme (cf. for instance Ta. ī "fly", ē "increase, "abundance" ; uḷ "interior of place ; mind, heart" ; kai "hand", kā "defence" ; To. kö.r "pond, tank" ; Go. sēr "plough" ; Mlt. nan "another" ; Br. bā "mouth" ; bil "bow") ;

(6) the use of subordinate words for analytic form- and word-building is characteristic even for the earliest monuments of the Tamil Sangam literature (I-III centuries A.D.).[7]

The work of all these factors may be summarised in the following equations which characterise a number of situations in the Dravidian languages :

morpheme=syllable
lexeme =syllable
morpheme=lexeme

In some cases we have even a tri-partite equation

morpheme=lexeme
" syllable "

In the Dravidian text written down with a morpheme-syllabic system of writing a monosyllabic morpheme will presumably be rendered by one or—if the writing is strictly syllabic—two signs at most apart from the determinatives and phonetic complements. The regular pattern of joining the root and non-root morphemes in the Dravidian languages (non-root morphemes beginning with a vowel are joined to the roots ending in a consonant and vice versa. Krishnamurti, 1961, 136–137) may be of a great epistemological value in establishing the functions of separate signs and their phonetic value.

2.0. In the " Preliminary Report on the Investigation of the Proto-Indian texts " the variable sign 27 was identified by Yu. V. Knorozov with a stylized drawing of the asvattha (pipal) tree and functionally defined as a termination of the oblique (adnominal) case. We should like to bring forward some additional data in favour of this point of view. (Predvaritel'noe soob-scenie, 1965, 50 ; cf. Gurov-Katenina, 1967, 175).

The positional characteristics of the sign 27 unambiguously indicating its auxiliary function, led many students of the Proto-Indian script to identify this sign as a formal termination, " the morpheme of genitive " (Hunter, 1934, 55–58 ; Meriggi, 1934, 215 218 ; Heras, 1940, 13). However, the suppositions concerning its pictographical prototype (its conventional treatment being " a vessel with handles " Hunter, 1934, 210 ; Dani, 1963, pl. la, lb ; cf. Vives, 1946, 92) were unable to solve the problem of how and why this sign came to be used as an auxiliary element. Identification of this sign with the styled representation of the pipal tree (Skt. pippala, aśvattha -" Ficus religiosa L.", " Ficus racemosa Wall ", " Ficus glomerata Roxb ") makes it possible not only to define its function but also to correlate it with a quite definite morpheme widely used in the Dravidian languages.

The name of pipal and the related species of trees, found in the earliest monuments of the Old Tamil literature (Tol. Elut., 203), originates from PDr *a(t)t-(V)y, *a(t)t-Vc (DED, 123 ; Ta. atti, attiru, attumāṉi, ata, atam, atavu " F. glomerata " ; Ma. atti " F. racemosa " ; Ko. aty " F. religiosa " ; To. oty " F. religiosa ; Ka. atti " F. racemosa ", Tu. attasa " F. religiosa " ; Te. atti " F. glomerata "). The morphological appearance of the Proto-Dravidian archetype could confirm the basic assumption that the name of pipal in Proto-Dravidian was phonetically close to the morpheme of the oblique (adnominal) case *-t-, universally spread in the Dravidian languages, and, therefore, might have been a

good substitute of it. (This morpheme may be reconstructed with great precision as *-(V)t(V), see Krishnamurti, 1961, 259).

The positional statistics of the sign (in particular, its combination with both variable and stable signs which are supposed to be references of root and non-root morphemes respectively) fully correspond to the morphosyntactic characteristics of the Dravidian " oblique case ". Frequent recurrence of this sign in the finals of the inscriptions may be explained not only by the peculiarity of the contents but also by the fact that at early stages of development of Dravidian languages the oblique case often played the part of concrete cases: locative, ablative etc. (Zvelebil-Glasov-Andronov, 1967, 23 : cf. Meenakshisundaran, 1965, 100).

2.1. Some Proto-Indian inscriptions contain a group of blocks with the final diagram 27 1. In certain cases the whole inscription consists of a single block of this type. It seems quite probable that the blocks delimited by the signs 27—1 are in fact names of different persons and mythological figures—proper names, titles, names of offices and professions, names and epithets of the deities, etc.

In Dravidian languages proper names (as well as other classes of names listed) include usually the denotatum (referent) of the name-bearer as the final component. The denotatum of the name-bearer may be expressed by :

(1) the gender (pronominal) suffix (Ta. -aṉ, -avaṉ (*m*), -aḷ, -avaḷ (*f*); Ma. -an (*m*), i (*f*); Ko. -n(*m*)-y, -i (*f*); Ka. -anu, -avanu (*m*); -aḷu, -avaḷu (*f*); Te. -ḍu, -vaḍu (*m*); -(r)ālu, -di (*f*); Kui -enju (*m*), -aḷi (*f*); Kur. -as (*m*), -ī (*f*) etc.);

(2) synsemantic word with the meaning " male person, man " (or respectively —" female person, woman "); this meaning is often specified according to the social and biological features: " lord (lady) " ; " father (mother) " ; " elder brother (sister) " etc. Cf. O. Ta. -āntai " father, ancestor " ;[8] -māṉ (<makaṉ) " son ; man, male person ; husband " ; ammai " mother, goddess " ; makaḷ " daughter ; woman, female ; goddess " ; alan " master, possessor ; husband " ; kiḻāṉ " old man ; proprietor, owner ; lord, master " To. o.ḷ " man "—in poḷ o.ḷ " the priest of the ti. grade diary "; (DED, 3383) ; O. Te. (inscr. VII-X cc AD)—bhaṭāra " lord " ; -raṭṭakuṭṭa, -raṭṭaguḍḍa " chieftain " ; bōya " a village officer " ; -ayya " father " ; honourable man " ; -anna " elder brother ", -amma " mother, goddess " ; Ko. -ayn " father " ; -av " mother ".

In feminine names " denotata " are found much more seldom than in masculine ones.

The part of the name immediately preceding the " denotatum " (as a rule the Dravidian name has several components) is in the attributive relation to the latter, it is thus expressed by a noun (or nominal group) in the Attributive (Oblique) Case.

E.g. many Old Tamil personal names as Eyiṟṟiṉār, Eyiṟṟiyār (PN, 213) derived from eyil " fortress " ; Māvaḷattāṉ (mā " great " +vaḷam " wealth, riches ", PN, 43) ; Īmattu-p-Pūtaṉ (īmam " burning ground, funeral pyre " +pūtaṉ " demon, ghost "). Analogical structure have the Telugu proper names found in the oldest inscriptions : Tirummunūḍla raṭṭoḍlu (SII X—598), Mēlkurti Caṇḍiyaṇṇa (EI XXX—280) etc.

2.1.1. It has already been noted that the " denotatum " is the final component in all Dravidian words. The formal analysis of the inscriptions under study has shown that the blocks with the final signs 27-1 are attested almost exclusively at the end of an inscription. As inscriptions on seals and amulets are very likely to include proper names, names and epithets of deities, names of professions or relation to tribal and social affiliations, the diagram 27-1 was conditionally identified with " the masculine denotatum " of the Dravidian onomastics. The phonemic and morphemic values of the sign 1 should be left open so far because non-root morphemes should be reconstructed with utmost care, taking into consideration new additional data.

2.1.2. Similarity with the Dravidian names may be established not only in the structure of the Proto-Indian blocks with the final diagram 27-1 but in their semantics as well. The authors of " Predvaritel'noe soobscenie " (1965, 51) have interpreted the combination yl-20 as the name of the Pleiades (cf. Ta. aṟu-mīṉ),[9] on the basis of the homonymy of two Proto-Dravidian roots mīṉ=// mīṉ= ' shine, sparkle, glitter ' and mīṉ ' fish '[10]. The tetragram yl-20-27-1 attested in the inscriptions M I 128, M II 233 may be interpreted by analogy with one of the epithets of the god Skanda (Murukaṉ) aṟu-mīṉ-kātalaṉ '(beloved) son of six stars (fish)'[11] which was wide spread in the Old and Medieval Tamil literature. This combination may be interpreted not only as the name of a deity but as a personal name of a man ; this practice was common in the Dravidian anthroponymics and remains so now.

The combination ɯ-20-27-1 (H. 164, H. 168, H. 121) may be similarly explained. The Old Tamil mummīṉ (lit. ' three stars ')

is the name of the fifth " lunar constellation ". The corresponding Sanskrit term mṛgaśīrsa=, mṛgaśīras= is attested in proper names (' born on the fifth day of a lunar month ').[12]

2.2. The sign 1 appears at the end of a block without its usual neighbour 27 in a number of texts (H 92, M I 168, M I 242, M I 288, M I 553, M II 249, M II 445, M II 595 etc.). There are reasons to believe that the sign 1 also functions as " the denotatum of the name-bearer " at least in several cases, namely in two-sign inscriptions like 8-1 (M I 286) or 10-1 (M I 168). (Let it be remembered that the formal expression of the Attributive Case before the denotatum was not a strict rule in the Dravidian names).

Special attention should be devoted to the diagram 1y-1 (M I 321, M II 249). The most probable supposition appears to be that in this case (as, indeed, in others) the numeral ' four ' (*nǎl=kV=DED, 3024) functions as an equivalent of another Proto-Dravidian lexeme *nal= ' good, correct, kind ; nice, best ' (DED, 2986) From the point of view of diachronic phonemics the possibility of such an equivalence is supported by the presence of a short vowel in various derivatives from the word ' four '. To. nal poθ " forty " ; Koḍ nanna. li " by fours " ; Te. nalguru " four persons "; Nk. nallal " four women " ; Nk. (Ch.) nalgur " four (masc) " ; Ga (S) nalgur " four " (masc.) ; Kui (Friend-Pereira) nal " four " ; nalgi " four things ".

(It should be pointed out that the short variant of the Proto-Dravidian *nǎl=kV=appears mostly in those cases when it is combined with a derivational morpheme or enters a word combination) If a possibility of such an equivalence is accepted, the diagram 1y-1 may be accounted for by analogy with such proper names as the Old Tamil Naṉṉaṉ (PN, 151), Toda Maso. n, Skr. Nala=which according to M. B. Emeneau goes back to the Dravidian root *nal=.

Another consideration offers fresh possibilities for identifying the sign 1y with the nal=. The characteristic feature of the secondary (non-quantitative) use of the sign 1y in Proto-Indian texts is its structural irrelevance : the symbols and their combinations which follow this symbol (such as 20, 39, 7 etc.) are regularly attested without this ' attribute ' in other inscriptions. The use of the epithet nal=, nalla=in the Old Tamil anthroponymics is marked by similar specific features. The epithet nal= offers a supplementary qualification of already available names without being an obligatory structural element: Nallantuvaṉar (AN, 43),

cf. Antuvañcāttaṉār (PN, 71); Nalluruttiraṉ (PN, 190), cf. Uruttiraṉ 'Rudra, Śiva'; Nakkīraṉ (AN, 57 ff.), cf. Antuvaṉ Kīran (PN, 329).

3.0. Most of the early Harappan inscriptions are engraved on tiny stone-plates. The different extra-linguistical reasons led the scholars to a tentative conclusion about some relationship between the contents of the inscriptions and ritual offerings to various deities. Certain supplementary considerations arising from the introduction of the Dravidian material will be discussed below.

The reverse of the stone plates with inscriptions usually bears a diagram consisting of a numeral (from one to four) and a sign 31 ("cup"). This block could be interpreted as the name of the sacrifice plus the indication of the number (or type) of offerings. The Dravidian material throws some light on the choice of this sign to express an offering. The Proto-South Dravidian *vēḷ=pV= (DED, 4561) is to be regarded as one of the oldest Dravidian words meaning "offer, sacrifice" (the Tam. vēḷvi is attested already in the I-II centuries A.D., cf. AN, 220). The root *vēḷ= 'to offer, to bring offerings' and its derivative *vēḷ=p(u) 'sacrifice' are not etymologised in the Burrow-Emeneau Dictionary.

Meanwhile this etymon can be related to the PDr. *veḷ -//*viḷ —"outside, exterior" >*veḷ—(C) -// *viḷ—(C)— "to pour (out), throw (out), expel". (Cf. Ta. veḷikkitu "to set out", Te. velucu "to drive, send out; (K) to shed (as tears); to step, cease (as rain); Pi. valip—"to expel, drive away" (DED 4526). Cf., also (DED 4529) Ta. veḷḷam "water, flood, deluge"; Ma. veḷḷam "water"; Te. velluva "flood, inundation"—obviously derived from PDr *veḷ-). The relationship of the ancient Dravidian concept of sacrifice and that of "pouring, sprinkling, scattering around" is supported by the parallel etymology of Kui word lāka "sacrifice; to make a sacrifice". This word accounted for in the Supplement to the Burrow-Emeneau's dictionary (DEDS 846; Go. lākāna "the sacrifice after a successful hunt"; Pe. rak "to offer worship, sacrifice"; Manda ṛak id; Kuwi lāk, ṛāk—"to sacrifice", lāga "offering to a deity") appears to be cognate to Ta. aḷakam "water", Ka. aḷaka "a liquid"; Te. aluku "to sprinkle, scatter"; Klm. (SR) alk—"to sprinkle"; Nk. aḷk—"to sprinkle"; Kui lāñja "to sprinkle, scatter around", Konda lonz—"to sprinkle or scatter (water, rice)"; Pe. ronj—"to scatter, bale out by sprinkling"; Kuwi lanzinal "to scatter"; ranj—"to bale out" (DED 254, 258; both etyma obviously<PDr. *aḷ-(V)k-, *aḷ-(V)c- with usual for the CDr. metathesis CV(C)>VCV(C). The same

semantic development is attested probably in the Kui word tlōmba "sacrifice" (in tlōmba mīḍa "a Kond boy through whom the offering is made to the earth god in meriah sacrifice", DEDS 556). T. Burrow and M. B. Emeneau connect it with Ta. tuvaḷ "to quiver, tremble" (DED 2578), though the derivation from PDr. *tuḷ- "to drip, sprinkle, spill the water" seems to be equally possible (DED 2764): Ta. tuḷi "to drip, fall in drops"; Ma. tuḷi "a drop"; Te. toluku "to rain, overflow"; Konḍa toṛk "to spill (water) from a vessel" etc. (In this case Kui tlōmba, Kuwi thṛomba<Pre-Kui-Kuwi *tuḷamp-. In our opinion Kui tlōnga "to be melted, dissolved, melt" is to be derived from the same root tuḷ-, rather from hypothetical *klōnga reconstructed by T. Burrow and M. B. Emeneau (DEDS 346)—cf. Ta. tuḷumpu "to melt".) We can state therefore that the conception of sacrifice in Dravidian languages is in general semantically related to the words denoting "pouring out (a liquid), sprinkling, spilling etc." (The only exception of this rule seems to be NDr. *et-p- (DED 675); Kur. erbnā "to cut the throat of, slaughter, sacrifice": Mal. eṛwe "to sacrifice, propitiate, worship"). If we take into account an ordinary for the Dravidian semantic shift "the act, process">"the instrument of the process" (Ta. nāṭṭam "examination sight">"eye"; nōkku "sight, vision">"eye"? Pj. cōrp—"to strain off water from boiled rice"~cora "an earthen pot") the choice of the sign 31 to express the notion of sacrifice becomes natural and comprehensible.[12]

3.1. The blocks on the obverse of the plates end in the sign 38 or the combination 27-38.

"Predvaritel'noe soobscenie" (1965, 50) points out that the sign 38 belongs to the class of variables and corresponds to one of the case affixes (presumably the Dative affix). This supposition is supported by the comparison of the structure of these inscriptions with the "sacral formulas" attested in the earliest monuments of the South Dravidian literature and epigraphics as well as in the folklore of illiterate Dravidian tribes. In most Dravidian languages the verbs meaning 'to give', 'to present', 'to offer' appear in a tri-partite configuration N^2+N^1+V where (N^1) denoted the direct object and N^2 stands for the indirect object (addressee) of action expressed by the Dative (cf. Zvelebil, 1958, 71). Cf. for instance: Ta. (I-II cc. A.D.) amalai-k-koluñ-cōru ārnta pāṇarkku akalā-c-celvam muḻuvatum ceytōṉ (PN, 34) "(He) gave all the kinds of wealth to the minstrels who had parttaken of the pure white rice"; Ta. (IX) śrī kṛṣṇarkkum śrī rukmini -p- pirāṭṭi yārkkum ammaṉaṟ kuṭutt-apaṭi eḻutiyatu "(This) was engraved as the gift by . . . to

the glorious (god) Kṛṣṇa and glorious goddess Rukmiṇi" (SJJ III-132); Te. (VII c. A.D.) . . . pāṛaku Kuṇḍikāḷula iccina pannasa "The land free from tax, given to the brahman . . . by the (? chieftain) Kuṇḍikaḷḷu" (EJ XXVII-288); Te. (IX c.) pandaraṅgu . . . āditya baṭāraniki iccina bhūmi. . . . "The land given to the (god) Aditya by the (chieftain) Paṇḍaraṅga" (EJ XIX, 271–275). Ko. and tongu. l . . . čo. ymk u. tm calcgra. rm "Our Todas . . . pay the meals to god" (K. II 334–337); Kur. naigas urmī naḍ guṭṭhige khēr asānum oṛbdas "The priest makes . . . the sacrifice of the fowl to every one of the evil spirits" (Grignard).

3.1.1. In the preceding paragraph we pointed out the functional similarity occurring in the use of the variable sign 38 with that of the morpheme of the Dative case. In the Dravidian languages the dative (destinative or additive-relative) morpheme apparently belongs to the oldest part of so-called "morphemic stock" (cf. Zvelebil, 1958, 73). According to data of comparative morphology, this morpheme (Ta. -(k)ku; Ma. -ku, -n̄n̄u; Ko. -k; To. -k, -g; Ka. -(n̄)ke, -(n)ge; Kod. -keu, -geu; Tu. -nu, -gu; Te. -ku (ki); kaī "for"; Klm -(g); Pj. -(u)g; - (g); Go. -k, - ; Kui. - ki, -gi; Kuwi -(a)ki; Kur. -gē; Mlt. -(i)k; Br. -(a)ki "for") may be reconstructed with great authenticity as *-k(V), -*n̄k(V) or, to be more precise, -*(V)(n̄)k(V)- (cf. Andronov, 1965, 54–55). Though treating phonetic identification of variable signs with due care, we shall, however, try to offer a tentative "reading" of the sign 38, proceeding from its pictographical meaning. The sign 38 apparently, renders some tool with long teeth; a comb, a grate, a trowel, a rake etc. (It has been proved archaeologically, that such like tools were familiar to the inhabitants of Mohenjo-daro and Harappa. E.g., see the ivory comb, reproduced in Mackay 1948, pl. XXIV,1). The names of these tools in the Dravidian languages as well as in many other languages are, as a rule, derivatives of the verbs "to comb, to scratch, to scrape". E.g., 1) Br. iris "comb" // Kur. ircnā "to scratch", Mlt. irce "to scratch the ground"; 2) Te. duvvena, Kuwi ruca "a comb" // Ta. uḷu "to arrange (as hair with fingers)", Ku. ug a. t—"to clean hair", Te. duvvu "to comb", Kui ṛūsa "to stroke, scrape"; 3) Ta. vāri "a comb, rake"; Ka. bācaṇige, Tu. bāraṇi "a comb" // Ta. vāru "to comb"; Ka. bācu "to comb"; Kur. bagnā "to comb"; 4) Ma. mānti "a scraper for coconuts" // Ma. māntuka "to scratch with nails".

Studying the existing names of cogged tools in the Dravidian languages, we find that many of them (as well as their underlying stems) could be traced phonologically from the prototype *kī(C)-,

*kĕ(C), as well as *ĭk(V)-, *ĕk(V). Referring also here are such names as Ma. ciru "scraper for coconuts", (?) Skt. (vara)kĭra (cf. DED 4388 for the first component) "a small comb "<PDr. *kĕr-, *kĭr- (DED 1305; Ta. cirai "to shave, cut with sickle"; Ma. cīrekka "to shave, scratch"; To. kerf "to scratch"; Ka. kere "to shave"; Pj. kirc "to scratch"; Mlt. qerce "to scrape"); Ta. cīppu "a comb, weaver's reed frame", Ma. cīppi, Koḍ cī:pï. Tu. cīpu, cimpu, Te. cīpu, Pj. kīpid "a comb" <PDr. *kĭ(p)- (DED 1341; Ta. cīvu "to comb"; Ma. cīntuka "to comb the hair with fingers"; To. ki. c "to comb"; Koḍ ci. p "to comb"), Konḍa kiṛpa "a comb <PCDr. *kiṭ- (DEDS 210 Konḍa kiṛa "to comb", Pe. giṛ- "to comb"; Kuwi kiṇ-, kiṛ- "to comb"); Ta. cikkam, Ma. sikkaṛuki, Ka. sikkaṭige "a comb"; Te. cikkanṭu (Campbell) "a species of comb with three or four teeth"<PSDr. *cik(k)-<(?) PDr. *kĭ-k- (DED 2059). It would not be out of place here to mention a number of Proto-Dravidian roots phonologically and semantically close to the type concerned, but for some reason not forming the names of tools. They are, for example, PDr. *ĕk(k)- (DED 652; Ta. ekku "to pull with fingers (as cotton)"; Ko. ek "to scratch"; To. ök "to scratch one-self"; Go. eh-, ehtānā, ahtānā "to weed") 14 PDr. *kĭc- (DED 127); Te. giccu "to scratch, pinch"; kice "to pluck (as strings of an instrument"), Kuwi kice "to pinch, nip"; Mlt. kise "to dig out a thorn from flesh"; Br. kishking "to pluck"); PDr. *ki(ṇ)ṭ- (DED 1290; Ta. kiṇṭu "to poke, scratch (as a fowl)"; To. köḍ "to flag"; Te. ceṇḍu "to cat"; Mlt. kinde "to cut flesh or fish")' PSDr. *kil-(V)y- (DED 1321–1322: Ta. kiḷai "to dig up, to stir, scratch up"; kiḷḷu "to pinch, pluck"; To. kily "to laddle out (food), to pinch" etc.); PDr. *kī(t)- (DED 1352; Ta. kīṟu "to scratch, scribble, write; Ka. kiṟu "to scratch, scrape"; gīku id., Te. gīṟu "to scratch, scrape"; giṟupu "to pass fingers through"; Kui gīra "line, mark" etc.).[15] Phonological similarity of the Dravidian etymons enumerated above can hardly be a mere coincidence; on the contrary, we have every right to suppose that all of them etymologically go back to the unique prototype PDr *ki(C)- "comb, scratch, scrape".

Since the derivatives of the root *kĭ- may be found in all the Dravidian languages and comprise about 35% of all the words recorded in DED with the meaning "to scratch, to comb", it is highly probable that the word "comb", which existed in one of the dialects of the Proto-Dravidian language five thousand year ago, had originated from that very root. So the phonetic complex *kīC (? *īk(V), *īkC-) should be regarded a most suitable phonetic

equivalent of the sign 38 ("comb"). Thus we may state that there is more than just functional similiarity between the sign 38 and the universal Dravidian morpheme of the dative case.

3.2. Many radical signs composing the basic block of the averse are identified as the names of deities (owing to their similarity with the Proto-Indian images and pictures.) The signs 5, 7, 12, 8 etc., are interpreted in this way.[16]

The appearance of the sign 13 ("a porter") with its variants 14 and 14[a] in the same position can hardly be explained from the extra-linguistic point of view.

All the same its function in the present context becomes more comprehensible if one takes into consideration the homonymy of the two PDr. root morphemes: (1) *kā-c-(?), *kā-p- "*pole with ropes hung on the end used to carry loads on the shoulder; a joke; a banghi*" (DED 1193; Ta. kā, kāvaṭi; Ma. kāvu; Tu. kāvaḍi; Te. kāvaṭi; Pj. kācal; Konḍa kānj-; Kuwi kāca; cf. Skt. kāca "der an beiden Seiten eines Jochs herabgehangende Strick mit einem Netze, in dem die Last liegt", etc.) and (2) *kā-, *kā-c-, *kā-p "*to guard, protect; to preserve, shelter*". (DED 1192; Ta. kā, kāppu, kāval; Ma. kāvu; Ko. ka. v; To. ko. f; Ka. kā, kāpu; Te. kācu, kāyu; Klm. kāy-; Kui kāpa; Kur. khāpus; Br. khwāfing; cf. Pkt. kāhila=gopāla).

If this correspondence proves to be cogent we can regard the sign 13 in the "sacrificial inscriptions" as—for instance—the PDr. archetype of Tamil kāvaṯkaṭavuḷ "Vishnu" (lit. "god-protector").[17] It seems probable then to explain the contents of the large group of inscriptions with the sign 13 as:

"To X (epithet?) /god-/protector—(number) of offerings".

We can interpret in this way such inscriptions as (H 475), (H 607), (H 680), (M I 532) etc.

The investigation of some Proto-Indian objects (not belonging to the group of "sacrificial inscriptions") allow us to confirm the interpretation given above. The sign 14 is engraved on the obverse of the clay amulet from Mohenjo-Daro (M II, CIII, 1), on the reverse of which we find imprinted figures of two animals —the tiger and the rhinoceros (most probably the brief variant of the politerion "elephant-tiger-rhinoceros-buffalo"—cf. "Predvaritel'noe soobscenie", 1965, 57). As it was stated by the authors of the "Predvaritel'noye soobscenie" (1965, 61–62), the

Proto-Indian politeria should be compared with so-called lokapala-vāhanas—birds and animals representing in the different systems of Indian mythology the regents of the eight points of the compass. The coincidence of occurrence of the sign 14 in combination with such animals is striking and probably significant. It is possible to compare this sign on the amulet O. Ta. kāppu "guardian deities of the eight points of the compass" (Cilap, 28, 231). We should add we do not attempt to reconstruct the "real" morphological appearance of the Proto-Dravidian (or "Harappan") word. We only try to point out that, in our opinion, the sign 14 corresponded in the "Harappan" language to some word derived from the root ka- with the same meaning as the Old Tamil kāppu. (The occurrence of the supergraphe 27 (14<13×27) indicates rather to the derivational morpheme *-t- ; *kā-t-, *e.g.* Ta. kāttayan, kāttavarāyan̲ "a village deity", cf. "Tirumukavilācam". Maturai, 1932).

3.1. In other cases the function of the sign 13 may be interpreted differently. In those inscriptions where the symbols identified as the names of deities precede the sign 13, the text of the obverse may be interpreted by analogy with a "protective formula" so often attested in Medieval Indian epigraphies which concluded donative inscriptions. E.g. O. Ta. (IX c.) itu ūrārum, kan̲attārum kāval "The inhabitants of (this) village and (its) officials will protect this" (lit. "this is the protection of . . .") (SJJ, XIV–34) . . . mukkiyārum itu kāppār ". . . The authorities will protect this" (SJJ, III–92). The sign 13 in such inscriptions has probably the meaning "protection, preservation" (PDr. kā) and the whole text could be interpreted as "X (name or epithet) god (goddess) will protect (this)", such interpretation may be applied to the inscriptions like (H 116), (H 479), (M I, 218 ; cf. M II, 134) ; (M II, 375) ; (Ch. LII, 12) ; (Ch. LII, 28) or (L. pl. XY, 3) ; cf. also H 404, M I 557 etc. The explanation of some blocks and signs preceding the sign 13 see below.

3.2.1. It will not be out of place here to give some preliminary considerations concerning designation of objects with inscriptions ending in 13. As we have already pointed out the ceramic triangular prisms, as well as two-faced baked sealings, found at Mohenjo-daro and other centers of the Proto-Indian civilization, were treated as amulets and talismans by most scholars. Similar *a priori* suppositions were also made as regards Proto-Indian seals (Marshall, II, 397). Wearing amulets protecting against evil forces (as well as against harmful influence of planets and constellations) is a very old custom, widely spread in India, particularly, in the Southern regions, at present. According to ethnologists the custom

not only acquired purely magic significance, but also became a part of many religious ceremonies, such as: giving a name to a baby, consecration of the twice-born (upanāyana), marriage etc. (Diehl, 1956, 68, 184, 252–253, 296 ft. ; cf. also Padfield, 1908, 94 ; Stevenson, 1920, 4, 27 ; Thurston, 1909, 273–274).

Among different objects used by the peoples of South India as talismans (silver, silk or cotton thread, work around the wrist or ankle ; sacred grass *Andropogon muricatus ;* mango leaves etc.) there are metal (mostly, copper) plates with magic emblems engraved on them (" chakra ", sun, moon, etc.). These plates are kept in gold or silver cases and are worn on a special string at the belt, on the loins, or on the forearm (Diehl, 1956, 273–274, 283, 318). As is clear from this description, some modern South Indian amulets are very similar in their composition to some Proto-Indian inscribed objects (especially – to the copper plates found in Mohenjo-daro and Harappa, of which it is not yet known what they are intended for). Purely formal similiarity, however insignificant in itself, becomes rather important, provided one takes into consideration the interpretations of inscriptions with the final 13 proposed in the previous part. To this we shall add that the term kāppu (" defence' ' PDr, ka-) is the most common name of amulets in the Tamil language. Here we must emphasize that although nowadays this term is generally used for talismans made of silver threads, in Old Tamil the word kāppu had also the meaning " (royal) seal " (Kalitokai 94. . . . cāyal iṉ mārpa ! . . . akatu āra-p-pulli muyaṉkuvēm ! tukul tapu kāṭci avaiyattār ōlai mukatu kāppu yāttuviṭṭaṉku. " Oh you with the beautiful breasts ! . . . Let us have an intercourse—to our hearts' (lit. bellies') content in the way the (respected) judges, whose wisdom is ruining for (human) vices, apply (lit. apply and take off) the royal seal to the charters on palm leaves ").

All the mentioned above allows us to suppose that Proto-Indian seals with inscriptions ending in 13 may have played a " protective " part and are a kind of amulets or talismans. This is partly maintained by the fact that the sign 13 occurs in inscriptions on " real " Proto-Indian amulets—two-faced baked sealings, identified by the earlier scholars as amulets (cf. H 304 ..). Inscriptions of such kind should, probably, be regarded in the whole cropus of Proto-Indian text as a special type (standard). By analogy with sacrificial inscriptions " this type could be called " protective " (apothropeic) ones.

The study of South Indian ritual (regarding the interpretations of the sign given above) makes it possible to explain, to some

extent, the appearance of this sign in the inscriptions of the Proto-Indian ceramics (cf. H CII, 15–17, where the whole inscription consists of the sign 13 only). In the cult practice of the Dravidian peoples of South India, there exists a rule, according to which all protective amulets (Ta. kāppu) are fastened to all kinds of inanimate objects, among them are silver and ceramic vessels serving as images of deities in some ritual ceremonies. This tradition being very old (many scholars emphasize it, see : Diehl 1956, 173, 253) we can consider the inscriptions with the sign 13 on ceramics as a kind of brief variant of " protective " inscriptions on seals.[18]

3.2.2. Combinations of the sign 13 with numerals may be interpreted in terms of the Tamil kā 'a weight ; a burden ' (in the) later system=100 palamsÆ54 kg.).

?.3. A further examination of the sacrificial " and " protective " inscriptions, leads to the interpretatation of certain symbols appearing on the obverse of the plates in preposition to the " names of deities ".

3.3.1. The sign 21 and its variants (21[a], 21[b]) may be determined pictographically as the image of barbel, a fresh-water variety of the carp (*Cyprinidae*) (*Barbus*—several species are known in north-western India—*Barbus tor*, *Barbus macrocephalus* etc.). In the DED the Dravidian names of the carp are represented by two sets of etyma: a) 1050 Ta. kayal, cēl ; Ma. kayal, kayyan "a river fish " ; Klm. kaye " fish " Nk. kayye ; Pj. key ; Go. kil, kīke " a small fish, a fish " ; (to this group should be added Kui klīngosi " fishbone " ;[19] b) 1620 Ta. keṇṭai, Ma. keṇṭa ; Ka. geṇḍe-mīn " a kind of fish " ; Te. gaṇḍe, geṇḍe, geṇḍiya, geṇḍi.

The Tamil words kayal, cēl, keṇṭai are the names of separate species of the carp (*Barbus carnaticus*, *Barbus fimbriatus*, etc.). At the same time they may be used both to term the entire Cyprinidae family and any fresh-water fishes in general. A similar broadening of meaning apparently took place in other Dravidian languages (" any variety of carp (Barbus) " > " a carp " > " fresh-water fish " > " fish ").

The Tamil kayal and its correlates go back to the Proto-Dravidian archetype *kay=al (*key=al), *kay= (*key=) [0] where *=al is a derivative formant widely occurring in the Dravidian languages, a comparative antiquity of the *kay- (*key-) could be deduced from the forms attested in Malayalam (kayyan), Parji, Kolami, Naiki and Gondi (kīke), as well as from the Sanskrit

borrowing kaivartta—" fisherman ". The second name of *Cyprinidae* (1620) may be split into two components etymologically, regarding the parallel Telugu forms : gaṇḍe, geṇḍe and gaṇḍu—cēpa (all three forms have the same meaning—" fish "). Ta. keṇṭai, Ka. gaṇḍe etc. may be supposed to go back to the PSDr kaṇṭay which in its turn reflects the *kaṇṭu-kay, *kaṇṭu-key, *i.e.*, the second name derives from the first one [21] (the possibility of the Proto-Dravidian *=k= being dropped is proved by the following examples : Ta. pātu " portion, share "—cf. Ta. paka " to be split, divided " ; Te. pagulu " to break, go to pieces ", Kuwi pakhali " to gash " ; Kuwi bhoiyi, bōi " smoke "—cf. Ta. pukai, Te. poga " smoke, fume " ; To. aḍ—" to dig "—cf. Ta. akaḻ " to dig " ; Ka. agaḻ " to dig " ; Klm. aguḷ " to dig " etc.).

For the first etymon not only direct etymology but a distant one could be established. The archetype *kay=, *key= apparently goes back to the *name of the red colour* common in all Dravidian languages (DED 1607), whose protoform is reconstructed as *kĕy=, *ke=m=, *kĕ= (cf. Emeneau 1953, 109–110). Such on etymology (connected with the fact that the males of the carp become brightly coloured during spawning) is supported by Skr. rohit=, rohita= ' red colour ' ; carp (*Cyprinus Rohita*) ; cf. also Bengal rūi-māch ' carp '. The order and character of phonetic changes in the names of the carp fishes show that the word ' carp ' could derive from the word ' red ' only in the Proto-Dravidian period.

Our etymology may not only help to establish the origin of certain Dravidian words (*e.g.* Tel. cēpa ' fish ' cēmpa kē=m=pa, (?) key=m=pa), but also to explain the frequent occurrence of the sign 21 in the Proto-Indian texts.

The epithet " red " (as well as names and designations derived from this epithet) are frequently attested in the Dravidian mythology, cosmogony and onomastics. Therefore the use of the sign 21 as the main unit (with a zero formant or with the variable 35) may be accounted for by a comparison with Tam. cēy ' planet Mars ; the god Skanda ' (lit. ' red '. Paripātal, 6–69) or Kō=c=Cēramāṉ Yaṉaikkaṉ=Cēy ' elephant-eyed Red /Skanda/, ruler from the /clan of/ Cēra ' (the name of a king from the Cēra dynasty—PN, 17, 22, 53). The inscriptions (M II 153) 21 : (M II 26, M II 47, M II 161) 21–35 etc., may be interpreted in this way. This could be the meaning of the sign in the inscription 21-13 (H 479). The trigram 21–27-1 (M II, C, 64) is interpreted by analogy with Tam. ceyyavaṉ, ceyyōṉ ' planet Mars, Skanda ' (Tol. Poruḷ, 50).

In the sacrificial inscriptions the sign 21 is most often met preceding the sign 5 ('goddess') ("Predvaritel'noe soobščenie", 1965, 50–51). The diagram 21–5 may be accounted for by Tam. ceyyavaḷ, ceyyāḷ 'the Goddess Lakshmi' (Paripāṭal, 22–4 ; Kuṟaḷ, 167) ; ceymakaḷ 'Lakshmi' (Kallāṭam, 39–4), Kota kempy 'red (the name of a woman)'. Cf. also Te. eṟṟama (eṟṟa 'red'+amma 'mother, woman' (proper name, VII-VIII cent. inscriptions) eṟṟapōtamma 'the name of a "rural goddess" etc. The combination 21–5 is attested in the inscriptions H 84, H 479, M I 137, M II 526.[22]

3.4. The use of the sign 20 in the position under examination is related to the already mentioned homonymy of the Proto-Dravidian roots *mīṉ='fish' and *mīṉ=//*miṉ 'to shine, flash, glitter'.[23] When combined with the supposed names of the deities this symbol expresses the epithet 'bright, shining, fiery' so common in the Indian mythology and applied to different personages ; it may also express the meaning of 'celestial' if the possibility of the *m=//*v=alternation is taken into account and thus the etymological relationship between *miṉ='to shine' and *viṉ=//*miṉ='sky' (DED 4422) is acknowledged (about a possibility of this relationship cf. Ramaswami Ayer, 1944, 147). E.g. Ta. viṉ-kō "Indra" lit. "the lord of the heaven" ; viṇṇavaṉ "celestial being", Te. vinudrammari "god" (lit. "one who moves the sky"), minusigavelupu, vinusigadēvara "Śiva" (lit. "the god having the sky as the lock of hair on the crown of the head").

Thus, the combination 20–5 attested in several inscriptions (M I 24, M I 214, X 342 etc.) may be defined as the prototype of the designation of the Goddess Saraswati minukūjēḍiya preserved in the Telugu mythology (minuku 'flash, twinkle, glitter'+cēḍiya, Cēḍe 'woman').[24] The broadening of meaning of the sign 20 with regard to the Proto-Dravidian etymon *viṉ//*miṉ—'sky' provides new interpretations of various polygrams including this sign. A further examination of the Proto-Indian texts should ascertain whether such Dravidian parallels as Mlt. biṉye "the god of thunder and lightning' have, perhaps, to be considered in the interpretation of the sign 20 within the basic block (*e.g.* in the diagram 29–20).[25] Attention should also be paid to the fact that the sign 20 and the trigram 20–27–1 are attested in two inscriptions (M II 222, M II 420) accompanying the picture of a three-faced enthroned personage.

3.5. Summing up our study of "sacrificial inscriptions" let us examine the inscription 20–5–36–II–31 (H 342) which is included into this corpus. The third sign of the inscription 36 is, in all

probability, a picture of a fishing hook (it resembles very closely the photographs and drawings of the fishing hook found in the Indus valley towns which were published in archaeological records —Rao, 1957, fig. 16). The appearance of this sign in the inscriptions presumbly connected with offerings to deities may be explained only if the following Proto-Dravidian homonymy is taken into account: *kuṭ=//*koṭ= 'crooked, curved' (DED 1709)—the names of hooks, sickles, garden scissors etc., in the Dravidian languages are usually derived from this root—and *koṭ-//*kuṭ- 'to give, bestow, present'. The verbs 'give' and 'present' derived from the root *koṭ= in the Dravidian languages are used mostly in the meaning 'to give something to somebody who, as a rule, is senior in age or position'. In this case, however, it is possible not only to identify the sign 36 with a definite phonetic complex, but to establish both the morphological structure of the Dravidian correlate and the character of the inscription. The name of the instrument from the root *kuṭ=//*koṭ= is often formed in various Dravidian languages by means of the derivational morpheme beginning with a labial consonant *=p=, *=v=, cf. Toda kwiṛ fo. l 'hook, billhook'; Tel. koḍavali 'sickle': Klm. koḍval (pl. koḍvasil) 'sickle', Nk. koḍval 'sickle' etc. (cf. Kui gōtori, gōtoni "hooked, bent like a hook"). At the same time a morpheme beginning with a labial consonant is one of the oldest Tamil causative formants, cf. in the Brahmi inscriptions (Mahedevan, 1968, 24–25) koṭu=pi=t=ōṉ 'he that made give'. If a case of abbreviated writing is assumed to occur once again and the sign 36 is taken to render the causative stem morpheme, the correlation between the name of the deity and the verb "to make (somebody) give (to the one who makes)" appears consistent with the rules of the Old Tamil grammar and norms operating in other Dravidian languages. As "peripheral" morphemes are not written along side with the symbol a double interpretation is feasible: 1) the sign 36 represents the name of action. In this case the combination on the averse of the plate renders the subject, while that on the reverse renders the predicate; 2) the sign 36 renders "the verbal attribute" (participle). In this case part of the text on the observe is the attribute of the diagraph on the reverse.

Thus, it becomes possible to interpret inscription H 342 in the following way:

Text: 20 [1]; 5 [2]; 36 [3]; II [4]; 31 [5].

Tentative transliteration (capital letters denote alternating phonemes whose exact value cannot yet be identified: *=ṉ=//

*=ṉ= ; *=p=//*=v= ; *=u=//*=o= ; the symbol— is written in those cases when the dropping of the accessory morphemes is possible ; /V/ denotes an unknown vowel) :

(1) mǐṆ= ; (2) /goddess/; (3) kǔṭP (V): (4) II ; (5) vēḷ/V/P=.

Translation: " That which the shining (var, celestial, beautiful) (1) goddess (2) made [us] give (var. makes us give) [her] (3) [is equal] to two (4) offerings (5) ", or : Two (4) offerings (5) , which the shining (celestial, beautiful) (1) goddess (2) made us give her (3) ".

3.5.1. The inscription H 342 should be compared with one of the inscriptions found in 1953-56 in Lothal during the excavations of S. R. Rao. This inscription, "Indian Archaeology" (1958-1960) p. XVI, B. made on a steatite seal consists of seven signs and reads as follows :

48 47 49—20—5—36—45.

Leaving aside the first block ending with the sign 43 (which are reserved for special investigation, since they are of special importance for determining the formal structure of Proto-Indian texts), we shall just point out, that the fundamental text of the Lothal inscription coincides with the text H 342 with the only difference that here the sign 45 appears in the place of the final diagram II-31. We shall also indicate the fact that this is not the only case of such substitution : in some Harappan inscriptions on tiny plates the sign -45 is an equivalent of the sign 31 in additional blocks with numerals (*e.g.*, the block -III-45 in the inscriptions H 528, H 529).

Pictographically the sign 45 (as well as its variants 45^a, 45^b) is defined as the profile representation of the (front) leg of soma cloven-footed animals : the vertical stroke corresponds to the tibie bone, the oblique stroke to the bones of the foot and metatarsus (this is the way they represent the legs of a bull or a buffalo, or other hoofed animals on Proto-Indian seals and amulets).

Such interpretation in itself, not supported by any linguistic data, cannot explain why this sign 45 serves in this case as an equivalent of " a block with a cup ". In Dravidian languages denominations of a leg of a hoofed animal are as a rule semantically connected with the word " hoof ". One of these names (DED 1519) goes back to Proto-South Dravidian : *koḷ-(V)k-, *koṇ-(V)k : Ta. kuḷampu " hoof " ; Ma. kuḷampu " hoof " ; Ko. kolk " hoof " ; To. kwïlx " lower joints of the calf's leg " ; Ka. koḷaga, koḷagu, koṇagu " hoof ".[26]

Phonetic (as well as, probably, semantic similarity of the archetype) *koḷ-(V)k-, *koṇ-(V)k- to the Proto-Dravidian etymon koḷ-, koṇ "to take, to buy; to get, to receive, to obtain"[27] gives the possibility of showing, at least presumably, to the cause of occurrence of the sign 45 in the inscriptions of the sacrificial type. Our explanation is based on the fact that in Dravidian languages a number of words with the meaning "taking", "buying", "getting", "accepting", "obtaining", and also "offering", "tribute", can be traced to the root *koḷ (see Ta. koṇṭi "tribate (PN, 51, 6), seizure as property (Maturaikkanci, 583); koḷkaī, koṇṭal "taking, receiving, accepting (Paripāṭal 4, 57)"; Ma. koḷ "taking, receiving, purchase": Ka. koḷ, koḷuha "taking, seizing"; kōḷ "seizure"; Te. kōlu "taking, plunder"; koluan "to serve, worship"; kolupu "festival of a god or goddess", Kui koḍa "buying, taking").

If we suppose that in "Harappan" language the phonetic complex similar to PSDr *koḷ-(V)k-, *koṇ-(V)k- corresponded to the sign 45 ("hoof") then its usage in the inscription with the transferred meaning "offering, (sacrificial) contribution" becomes quite likely. Obviously, the phonetic composition of the Dravidian word "contribution" might have been very close to *koḷ(V)k or even fully coincided with it (cf. the examples given above: Ta. koḷkai "accepting" //Ko. koḷk "hoof").

In consideration of the foregoing we can offer the following interpretation of the Lothal inscription:

. . . 20 [4], 5 [5], 36 [6], 45 [7], mīṆ [4], (Goddess) [5], kǓṭP(V)=[6]kōḶ=[7] (capital L showes to the possibility of the alternation ḷ/ṇ). "The offeiing (7) which the shining (celestial, beautiful ?) (4) goddess made [us] give [her] (6)".

Contrary to the inscription H 342, the formal structure of the inscription from Lothal allows for an unambiguous linguistic interpretation: the head-slot, expressed by the noun phraze *kōḶ= is preceded by a qualifying slot, expressed by the verbal phrase miṆ= Goddess kUṭP(V)=.[28] Hence, of the two variants of the Harappan inscription, suggested by us, the second one seems to be more correct. Most probably, the sign 45 is used with the meaning "sacrifice", "(sacrificial) offering" in the inscriptions on the tiny plates H 528 and H 529. (Cf. also an inscription on the votive statuette of a buffalo from Chanhu-Daro-Ch. XCIII, 16).

3.6. We feel bound to explain somehow the choice of the etymon koḷ-(V)k- for the connotation of the sign 45. Among other

Dravidian words with the meaning " hoof ", leg " (of an animal) " (DED 1474, 1615, 2412) it seems to be the most probable phonetic equivalent of this sign first of all because this very " reading " is confirmed in a number of combinations of the sign with the sight having been previously explained. One of these combinations is the block 45–20, occurring in Proto-Indian texts within the polygramms (see H 693, M I 110, M I 130, M I 211, M I 237, M I 242, M II 323).

This block may be interpreted by analogy with Old Tamil kol, konmin " planet " (see Cirupāṇāṟṟupaṭai 242).

The etymology of Ta. kōḷ, kōṉmiṉ is far from being clear. The compilers of " Tamil Lexicon " (v. II, pt. IV, 1928, p. 1202) connect it with the root koḷ " to take, seize " and obviously regard this word as a calque of Sanskrit graha—" planet " traditionally derived from the root grabh—" to take ". Judging from the purely semantic point of view, one must admit that such type of development (" take, seize " >" planet ") is rather uncommon. Semantic shift (graha- >grabh-) attested in Sanscrit has no parallels in other Indo-European languages. At the same time, we could have more or less sound explanation of this phenomenon, if we suppose that the process of borrowing was taking the opposite direction *i.e.*, that Skt. graha -is a *loan-word from Dravidian* and must be considered as a false translation of Tamil kōḷ (or some of it's prototypes). The word kōḷ (kōṉmīṉ) could be naturally etymologized on pure Dravidian ground. Besides the meaning " planet " this word means also " nakṣatra (lunar mansion) ; " ascending mode of the moon " and—which is the most important—" brilliance, lustre ". The derivation of the names of different astral bodies (" sun ", " moon ", " star ") from the words denoting " light, lustre, shine, heat, fire " is one of the stable features of the Dravidian semantics (*e.g.* : PDR. mīṉ " star " >mĭṉ//mĭṉ- " to shine, glitter ", Ta. oḷiyavaṉ " sun " oḷi " lustre, brightness " etc., see Ramaswami Aiyar. 1944). Ta. kōḷ " planet " is to be connected not with the PDr, *koḷ-, *koṇ " to take ", but with another root having probably the same phonological appearance—*koḷ- " to burn, to be hot ". (DED 1794 ; Ta. koḷḷi " fire-brand, fire " ; koḷuttu " to kindle, set on fire " ; koḷuntu " to burn " ; Ma. koḷuttuka " to set on fire, light, kindled ", To. kwily " firebrand, glowing ember " ; Ka. koḷḷi, koḷḷe " firebrand " ; Ta. kolli, koḷḷi " id "). This etymology is confirmed by Ta. cuṭar " sun, moon " which has also the meaning " planet " (Paripātal, 1917) and could be traced back to the base cuṭu " to be hot, to burn, etc".

3.6.1. One should not be surprised at the fact that such words as "planet" do occur in Proto-Indian texts. First of all, the inscriptions semantically connected with ritual performances (and such are, as far as we can judge, not very few) can comprise special "calendar" blocks, denoting the date of certain ceremony. But this assumption does not explain all the occurrences of the block 45–20, in particular—the trigram IX-45–20. This trigram represents the whole inscription (H 693) and may be interpreted as "9 kŏḶ-mĭṆ-"—the equivalent of the Sanskrit term navagraha "nine planets" (Sun, Moon, Mars, Venus, Saturn, Mercury, Jupiter —and two imaginary planets Rahu and Ketu, associated with the ascending and descending node of the moon).

We shall have to dwell on the contents of such inscriptions as H 693 together with their hypothetical function. Planets, constellations and astral bodies are not believed to play any important role either in the religion of the Vedic Aryans or in the cosmogonic model of the Vedic period. In his study on the mythology of the Vedas, A. Hillebrandt (1902, 102–104, 107) seriously doubts the fact that any planets, besides the sun and the moon, were known to the Aryans of that time at all. It was only in the beginning of the first millenium B.C., the time when great epic poems were created, that cosmic objects definitely enter the religious consciousness of the Indian and take their due place in the cult practice. As is well known, this period chronologically coincided with broad assimilation of Dravidian beliefs and cults. It is in this period that anthropomorphic (to be more precise, theomorphic) interpretation of planets and constellations was being formed (cf. the identification of the planet Venus with the teacher of the Asuras divine sage Śukra (Uśanas-), Jupiter with the teacher of gods Bṛhaspati, the cluster of Pleiades with six mothers (nurses?) of the God Skanda etc.; cf. Hopkins 1915, 34, 85-86, 92–94, 180).

Apparently, a special sacrificial ritual referring to the planets (Skr. grahapūjā-) appears at the same time.

Affluently represented in "Mahābhārata" and "Rāmāyaṇa", astral and cosmic allusions are not uniformly distributed throughout these poems. A considerable number of such allusions, directly connected with the essence of the myth, may be found for instance, in the legend of the God Skanda mentioned above (MBh. III 224, 14–31; 225 7–14; 226 26; 228 31; 229 28; 230 8–11; 232 18).

In view of the fact that the cult of Skanda was apparently borrowed by the Aryans from the pantheon of the Old Dravidians,

and that the myth concerned is full of elements of non-Aryan (sometimes, obviously, Dravidian) character, it is highly probable that at least some cosmogonical conceptions (in particular, that of nine planets) existed on Indian grounds before the middle of the second millenium B.C. and were adopted by the Aryan conquerors from the autochthonal Dravidian environment. It is significant that at present the cult of planets is especially popular among the peoples of South India.

The Swedish scholar C. G. Diehl states in his research that the influence of planets on the fate of man is compared at present in Tamilnad with the influence of gods and demons (pēy). One can find anthropomorphic representations of nine planets (navakkira-kam) in any Saivite temple. Moreover, there are special shrines created in their honour (*e.g.*, the temple Somasundaram in Mathurai).[21] It is noteworthy that in some Tamil sources planets are fully identified with gods of Hindu pantheon—Şiva, Viṣṇu, Murukaṉ (Skanda), Yama (Diehl, 1956, 159, 209-210, 298 303).

Thus, the inscriptions of the type H 693 may be related in their composition not only to temporary localization of certain ritual performances, but they also may be immediately connected with a type of god-worshipping. It is worth reminding that among Proto-Indian texts there exist a number of blocks and inscriptions which may be interpreted in astral-cosmogonic terms. Besides the inscription H 693 and the blocks yI 20 and III–20, explained above, we shall point out, just for an illustration, to the inscription yII-20 (H9). While interpreting this inscription (cf. Gurov—Katenina, 1967, 176) we considered it as a prototype of the Old Tamil name for the Great Bear -eḻu-mīn " seven stars (=fish) " (Naṟṟinai, 231). Since the epic period the constellation of the Great Bear was worshipped in Ancient India an incarnation of "seven seers" (Skt. Saptarsi). Having no intention to dwell on the function of the Great Bear in the Ancient Indian cult tradition (cf. Negelein, 1929), however, we should like to emphasize that this constellation, as well as the Pleiads, play an essential part in the legend of Skanda's birth and that of the Flood, *i.e.*, in the myths, where a non-Aryan element shows most distinctly (MBh. III, 187, 30–46 ; 225, 4 ; 228, 31, etc.).

Various suppositions are possible concerning the functional characteristics of the inscriptions of the type H 693, H 9. These texts, consisting of a root block, generally without any variables, may be considered as proper names derived from those of planets and constellations (see above 1.2). It may also be supposed that

the inscriptions may indicate some sanctuaries and temples dedicated to certain astral objects. In both cases we should look upon the texts H 9, H 693 etc., as a kind of abridged versions without any name—bearer's denotatum or any formal referent of the word "temple, sanctuary" (="St. Paul" instead of "St. Paul's Cathedral"). However, more probable is the explanation connected with "protecting function" of a amulet or a talisman. The inscriptions consisting of a single name of god (or some worshipped cosmic object) may, in this case, show to what god the adept, sacrificing an offering, entrusts himself, or from what malign forces he attempts to be protected. Therefore, we are inclined to consider the inscriptions of H 9—H 693 type as a kind of brief variants of the "protective inscriptions" discussed above in 3.1.1. It is only natural that the interpretation of these inscriptions will become possible only after a more thorough study.

To finish up the consideration of the different types of Proto-Indian inscriptions ("sacrificial", "protective" etc.) we may state that their further close analysis may prove useful not only for the study of the Indus Valley script but also for elucidating the earliest stages of the development of the Indian Culture.[30]

ABBREVIATIONS

AOR	..	Archiv Orientalni.
AN	..	Akanāṉūṟu.
BSOAS	..	Bulletin of the School of the Oriental and African Studies.
Ch	..	E. J. Mackay, Chanhu-Daro Excavations 1935-36. New Haven, Connecticut, 1943.
Cilap	..	Cilappātikāram.
DED	..	T. Burrow, M. B. Emeneau. Dravidian Etymological Dictionary. Oxford, 1961.
Ei	..	Epigraphia Indica.
Grignard	..	A. Grignard. An Oraon-English Dictionary. Calcutta, 1924.
H	..	M. S. Vats. Excavations at Harappa. Delhi, 1940.
IL	..	Indian Linguistics.
ILJ	..	Indo-Iranian Journal.
JBORS	..	Journal of the Bihar and Orissa Research Society.
KrT	..	Kuṟuntokai.
K I-III	..	M. B. Emeneau. Kota Texts. Pt. I-III.

L	..	S. R. Rao. The Excavations of Lothal. Lalit Kalā. Nos. 3-4, April 1956—March 1957.
M I	..	J. Marshall. Mohenjo-Daro and Indus Civilization. Vol. I, II, III. London, 1931.
M II	..	E. J. Mackay. Further Excavations at Mohenjo-Daro. Delhi, 1938.
Mbh	..	Mahābhāratam.
PN	..	Puranāṉūṟu.
QJMS	..	Quarterly Journal of the Mythic Society (Bangalore).
SII	..	South-Indian Inscriptions.
TC	..	Tamil Culture.
TPS	.	Transactions of the Philological Society.

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NOTES AND REFERENCES

[1] The possible ethnic and cultural affinities of the Dravidians with the Mediterranean peoples was stressed in a number of works by professor S. K. Chatterji (cf. for instance Chatterji 1924, 1945, 7; 1959, 301, 323–324 etc.; also cf. Ramaswami Aiyar, 1929–30; David 1954, 1955, 1956; Cornelius 1954, 1955). It should be noted that some writers tried rather unsuccessfully to prove the genetic relationship of the Dravidian languages with those of the Mediterranean area : Lycean, Basque and others (see : Chatterji 1954, 17–18 ; Lahovary 1957, 1963).

[2] " Geistige Arbeit " No. 5, 5. März 1937, 3, 10. Cf. Hrozny 1941, 15–16.

[3] H. Heras, 1940, 59. The most important works by H. Heras dealing with the problem of interpretation of Proto-Indian script. See Reference List, No. 52–57.

[4] The basic data on this problem may be found in Nilakantha Shastri 1958, 52–57, 61–62 For the latest data q.v. Sankalia 1968 ; cf. K. Zvelebil 1968, 22. Some considerations concerning the destiny of the Proto-Indian script after the fall of Mohenjo-daro and Harappa were given at the 1964 symposium in Puna by V. N. Misra (Indian Pre-History 1964, Deccan College Building Centenary and Silver Jubilee Series, No. 32. Poona 1965, pp. 164–165).

[5] This feature is regularly pointed out in all general works on the morphology of Dravidian languages. Cf. Bloch, 1954, 1-2 ; Kuiper, 1948, 17 ; Meerwarth, 1929, 221 ; Andronov, 1965, 45-46.

[6] Monosyllabic non-root morphemes comprise 49·5% of all derivational and word-changing affixes in the usage of Perunkundrur Kizhar, a II-century A.D., Tamil poet. The percentage of monosyllables among the noun morphemes is 58%, among the verbal morphemes—38·6%. (Zvelebil-Glasov-Andronov, 1967, II-109).

[7] Zvelebil-Glasov-Andronov, 1967, 20, 24, 133, 144 ; cf. Meenakshisundaran, 1965, 35-38.

[8] About the meaning of antai cf. Mahadevan, 1968, 27, where the author disproves the opinion of the medieval commentators of the Sangam literature who regarded antai as ataṉ+tantai ("father of Atan").

[9] About the possible etymological relationship between Proto-Dr. *mīn- 'fish' and *mīn-//miṉ- "to shine" registered already by R. Caldwell (1856, 446 447) ; cf. also Ramaswami Aiyar, 1944, 142-150.

[10] Certain supplementary considerations cf. Gurov-Katenina, 1967, 176.s

[11] First registered in one of the earliest Tamil dictionaries "Tivakaram" (VIII A.D.). It is noteworthy that there is no exact correlate to this name among the Sanskrit names of Skanda listed in the "Mahabharata" (III, 232, 3-9). The closest would be Saṣṭhipriyaḥ which in B. L. Smirnov's Russian translation sounds as "the friend of Saṣṭhi /Parvati/' (1958, 277).

[12] The name Mrgasirsah is given to the "king of Naga (snakes)" in the Buddhist treatise "Karaṇḍavyūham" (12). "Lunar constellations" are quite often attested in the Ancient Indian anthroponymics, cf. such masculine names as Ardraka-, Puśya-, Mūla-, Śravisthaka-derived, respectively, from the names of the 6th, 19th and 23rd "lunar house"; cf. also feminine names—Rohiṇi, Revatī, Maghā etc. The name of the full moon day Sinivali is at the same time the name of Devasenā, the wife of the god Skanda (cf. Hopkins, 1915, 70).

[13] On the possibility of the non-Aryan (Dravidian) influence on the form and composition of the Indian sacrificial ritual cf. Chatterji, 1959, 319-321. The word denoting "sacrifice offering to a deity" in some Dravidian languages could be at the same time an underlying stem for the denominations of person taking active part in the process—i.e., the priest (as an actor of the sacrifice) and the god (as an object of sacrificial act): Pe. ṛākeljāni ' priest who offers sacrifice"; Kuwi. thṛomba, trombēsi "priest"; Te. vēl(u)pu, vēḷpu "god". Could it be possible to connect the Sanskrit name Skanda, traditionally derived from the root ska(n)d—"schnellen, springen, spritzen (intr.), herausgeschlendert werden, hinausfallen" (Bothling) with the above-mentioned Dravidian term meaning "god" (<PSDr. *vēḷ "to sacrifice".) The Dravidian etymology sounds more natural—cf. also Ta. vēḷ "Skanda ; Kama", probably from the same root.

[14] In his review of the "Dravidian Etymological Dictionary" by T. Burrow and M. B. Emeneau (Language, v. 39, No. 3, 1963). Bh. Krishnamurti suggested that OTa-k (āytam) should be considered as the reflex of the Proto-Dravidian laryngeal *H. According to this hypothesis the preform of the etimon DED 652 must be reconstructed as *eHk-(probably even as *aHk- cf. Ka. yakka "to press cotton, card wool").

Though considering Bh. Krishnamurti's assumption more than probable, at present, we, however, prefer the reconstruction without taking OTa. āytam into consideration, since sound correspondences of this phenomenon in other Dravidian languages has not been thoroughly studied.

[15] The Dravidian morpheme of the dative case could have been equally represented by the word "comb, scraper etc." derived from the PDr. archetype *kŭ-C-, *ŭk(V): cf. PDr. *uk-(V)r (DED 592), PDr. *uz-, *uk-(V)z (DED 593), PSDr *ok- (DED 783), PDr. *kŏ-ṭ-(DED 1869). The majority of etyma with the meaning "to scratch etc." which cannot be referred to both type mentioned above which go back to the pre-form pa-(C)-, va-(C)-see DED 3313, 3364, 3607, 4255, 4302, 4304, 4333, 4357, 4388, 4393, 4407, DED 3855.

[16] The identification of certain signs from this group is supported by the data from the Dravidian mythology and onomastics, cf. such paraphrases of the god Skanda (Murugan) as Tam. Ayilaṉ (Ayilavaṉ)<ayil 'spear, jevelin'; Vēlaṉ<vēl 'trident, spear'; cf. also Villi, Villavaṉ "the god Kama"; "Virabhadra"<vil 'bow'; ceṉkōrkatavuḷ "Yama" (lit. "the

god with the right sceptre, club "—"the god of justice and virtue "). We must add that the (Sanskrit word daṇḍa-, being a constant epithet of the God Yama (see above), is supposed to be derived from the PDr. *taṇ-, *tat- " to knock ; beat etc." (Burrow, 1946).

[17] In the Tamil Brahmi inscriptions the name Kavuṭi Īteṉ is attested which K. Zvelebil (1964, 562) explains through kāvaṭi ' pole for carrying burdens '+īcaṉ ' god '. Cf. however,' Mahadevan, 1968, 27 where kāvuṭi is explained from Skt. gauda- ' the country of Gauda ' (the ancient name of Bengal).

[18] As it was stated by Professor B. B. Zal (1960 ; 78) the sign 13 is attested among the pictographical symbols inscribed on the megalithic and chalcolithic pottery from South India.

[19] The second component of the Kui word is evidently connected with Kur. kẖocol, Mlt qoclu ' bone ' (DED, 1816).

[20] On a possible alternation of PDr. *ay//*-ey- cf. Krishnamurti, 1961, 139–140.

[21] The etymology of the first component is not quite clear ; perhaps it is connected with PDr. *kaṇ-ṭ(V)- " male " (DED, 986) ; cf. however, Kur. kiṇḍo " a species of fish " ; kiṇḍo injo " carp fish ". Regarding the Kurukh words it seems to reconstruct the first component as PDr. *keṇṭu " (carp) fish " and to qualify *keṇṭu-kay, *keṇṭu-key as a synonymic compound (Ta. kayarkentai " a kind of kentai fish "<kayal+kentai).

[22] In the Ancient Indian mythological literature the epithet (Skt.) piñgala- " rothlich braun, gelb " refers to the goddess Lakṣmi and also to Siva (Rudra) and to some persons of his retinue (" Gautamadharmaśastra ").

[23] The Sanskrit root miñj- " scheinen, leuchten ". (Botlingk, 1884, 77) is an evident borrowing from the Dravidian languages. The second meaning of this root " reden, sprechen ' is related to the Proto-South Dr. min- " to mumble, prattle " (DED, 1978).

[24] The Indian epic supports indirectly the presence of the epithet *miṇ- " bright " in the pre-Aryan mythological inventory. The story of Skanda's origin includes " a paired deity Miñjikā (fem.) and Miñjika (masc.) which emerged from Rudra's semen, see MBh. III, 221 ; 10–14. The commentators trace this name back to the root miñj- ' to shine ' (Smirnov, 1958, 664 ; cf. Hopkins, 1915, 231). On the possible alternation of PDr. -ṇ-//-ṉ- cf. Krishnamurti 1961, 87).

[25] Many scholars beginning with R. Caldwell tried to establish etymological links between the name of the sun god Vishnu and the Proto-Dr. *viṇ-//*mıṇ ' sky ' (cf. Ramaswami Aiyar, 1944, 149 150 ; Chatterjee 1959, 323). This etymology cannot be regarded as reliable.

[26] Compare also to DED 1615 ; Te. gitta " hoof " //Pj. gēṭa " leg from knee to ankle " ; Kur. kẖeḍḍ " foot, leg ".

[27] Judging by the composition of the entry 1519 in DED, T. Burrow and M. B. Emeneau are inclined to consider not PSDr. *koḷ-, but *kuḷ as the prototype of Ta. kul- ampu and its correlates. Meanwhile, if one takes this etymon separately, one cannot unambiguously define the quality of its root vowel, since in the South Dravidian languages the PDr. *u-//*o- alternation is attested before the *-a in the next syllable.

On the other hand the relation of PSDr. *koḷ-(V)k with PDr. *koḷ- (DED 1788) can hardly be considered a mere homonimy : the root *kol-, *kon- might have meant not only " to take " " to sieze ", but also " to clasp ", " to tie ", " to button " (Ta. koḷuvu ' to clasp, buckle up " Ma. koḷutuka " to hook, clasp " ; Koḍ. koḷit- " to fasten ") and among its derivatives one my find such words as Ta. koḷuttu- " joint of the body ", clasp of jewel " ; koḷukki " hook clasp " ; Ka. koḷike " a clasp, hook ", Ta. koṇṭi " hook, staple that holds the latch of a door " Te. kolivi " clasp of a necklace ".

[28] See Zvelebil-Glasov-Andronov 1967, 41 f. Cf. also K. Zvelebil. How to handle the structure of Tamil. A. Or. 1962, v. 32, pt. 1.

[29] On the representations of planets in the Indian temples—see Moor 1810, 281 pl. 10 ; Gopinatha Rao 1916, I, 61–66 ; cf. also David Pingree. Representation of the planets in Indian Astrology. IIJ, v. VIII, No. 4 (1963).

[30] Abbreviations for the names of languages, mentioned in this articles : Br. Brahui ; Ga. (S)—Gadaba (Salur) ; Go.—Gondi ; Ka.—Kannada ; Klm.—Kolami ; Ko.—Kota ; Kod.—Kodagu ; Kur.—Kurukh ; Ma.—Malayalam ; Mlt.—Malto ; NDr.—North-Dravidian ; Nk.—Naiki ; PDr.—Proto-Dravidian ; Pe.—Pengo ; Pj.—Parji ; PSDr.—Proto-South Dravidian ; Skt.—Sanskrit ; Ta.—Tamil ; Te.—Telugu ; To.—Toḍa ; Tu.—Tuḷu.

The Indus Script Decipherment

The Situation at the end of 1969

ASKO PARPOLA

As the year 1969 draws to a close, it seems desirable to present a concise, systematic survey of the results achieved so far by our team in the decipherment of the Indus script, and to consider the problems and prospects of future research. In doing so, I will refrain from detailed argumentation, concentrating on the main points and referring the reader to the bibliography (section F) for our published statements and published criticism.

This paper is divided into five sections (A—E), the first of which will describe our method in the simplest possible terms. The second (B) will provide the main results, with a discussion of the historical and cultural consequences of the linguistic evidence. Section C will offer a series of arguments that we consider to be proofs for the correctness of the decipherment, while section D assesses the main arguments of those who have criticised various aspects of our work. In section E we give our own plans for publication, and point to fields of study that are vital to future research.

A. Our Methods

The present account of the nature of the researches carried out by our team in the years 1964–1969 is given in chronological order, omitting those activities which from the point of view of decipherment are of only secondary interest.

1. We first *collected statistics* about the signs used in the Indus inscriptions with the help of computer. Thus we prepared lists giving the total number of times each individual sign occurs in these short inscriptions, how many times at the beginning and how many times at the end of an inscription. We also recorded, with similar statistics, which other signs can occur on the right and on the left side of each individual sign. The computer further provided us with lists of all occurrences of selected sign combinations, citing the entire context

2. On the basis of these lists we were able to begin *analyzing the material.* It was possible to divide many inscriptions into

separate words by *comparing the occurrence of stable combinations of signs in different contexts.* The words could be classified into different groups on the basis of their behaviour.

3. The division of the inscriptions into words also enabled us to *identify the inflexional elements.* Some of the most frequent signs of the script are constantly found at the end of words, usually at the end of an inscription, sometimes also in the middle, but never at the beginning of an inscription.[1] These signs, which can vary with each other at the end of one and the same word (stable combination of signs) in different contexts, could be interpreted to form the following paradigm :

	Singular	Plural
Nominative	Zero	
Genitive		
Dative		

4. The *interpretation of the paradigm* was based on the following considerations. A nominal declension only seemed to come into consideration. A comparison with *seal texts in known scripts*, especially those of the contemporary Sumerian civilization, with which the Indus people are known to have been in contact, made it most likely that the most common oblique case suffix represented the genitive and the other, the dative. The language type seemed to be agglutinative and the other series therefore to represent the plural declension. That it did not represent the feminine declension was confirmed by the identification of two further signs as denoting gender. They occur as clearly independent words, behave alike, and occur as determinative elements attached to other signs forming ligatures :

Man	
Woman	

Only after we knew** (on the basis of the **above analysis of their behaviour**) **what these seven signs must** stand **for, did we endeavour to link the script with a definite language.

5. In our efforts to decipher the Indus script, we worked on the hypothesis that *the principle underlying this script*, which came into use around 2500 B.C., was *likely to correspond to that of the contemporary writing systems*. The logosyllabic script which was prevalent in those days is to a large extent based on an invention made around 3000 B.C., possibly by the Sumerians: pictures of objects are often used not to denote the object itself, but to stand as a phonetic representation. Thus grammatical elements and abstract ideas that would be difficult or impossible to represent through a picture could be expressed in writing. In archaic Sumerian the picture of an arrow, which is *ti* in Sumerian, also stands for the word *ti*, *til* meaning "life". We accordingly *tried to find a language in which the suffixes or words which we knew to be intended by the signs discussed in A 3 and 4 would be phonetically similar with the objects depicted by the pictograms with which they are written.*

6. It was economical to start by *selecting the most probable language*. *Historically* the most likely candidate seemed to be the Dravidian group of languages, which are today spoken by over 100 million people, mainly in South India, but also in Pakistan near the Indus sites. These languages are known to have been spoken in India around 1500 B.C., when the Indo-European Aryans came to India, and have a literary tradition since the third or second century B.C. They represent the *agglutinative type* of languages, in which the words are inflected by adding suffixes to the stem, and to which type the language of the Indus inscriptions also seemed to belong.

7. Methods of *comparative linguistics* were needed *to bridge the gap* of 1500 years between the earliest historically recorded Dravidian (Old Tamil) and the supposed Dravidian of the Indus inscriptions. Later Indo-Aryan loanwords had to be excluded, and older forms and primary meanings to be reconstructed by comparing the words in the various modern languages. The reconstructions could be checked, in many cases, by comparing the early Dravidian loanwords in Sanskrit. The greater the number of languages using a particular word, and the more widespread their distribution, the greater was the probability of its having been used in the days of the Indus civilization.

8. The first sign studied in this way gave striking results, and the second convinced us that the code had been broken. In slightly revised form, our equations look as follows:

=picture of man with a carrying yoke=**kaḻi* " carrying yoke "=**kaḷi* " much ", an originally independent word suffixed to denote the plural concept, which in course of time has become shortened, resulting in the modern plural suffix *-kaḷ*.

=" woman, female " (A 4) =**peṇ*, **peṇṭi*. =**peṇika*, **peṭika*, **peṇṭika*, " comb ".[2]

9. In continuing the work we endeavoured to use all the knowledge we were gaining to further research. It was inevitable that we should make mistakes, but it was possible to *control the research* in various ways and to correct mistakes like in solving a cross-word puzzle. One way to check the correctness of the decipherment of a particular sign is to study *all the various contexts* in which it occurs: the more we can read, the more effective this control becomes. The same may be said about another important way of checking the results, *the rules governing the phonetic correspondences between the equated homophones* which gradually emerge as the work goes on. Other aspects of the writing system were similarly observed, such as to what extent ideographic signs and rebus signs are used.

10. Semantic *clues* were sought in inscriptional and broader context (including the nature of the object on which the inscription is found, the accompanying iconography, the archaeological context, etc.) and in ligatures. Graphic variants of the signs themselves, painted pottery and the Indus civilization in general, signs of the other ancient scripts, etc., were studied in order to understand the outer appearance of the signs.

11. Finally we were able, when already understanding something of the texts, to link their contents with *later Indian civilization* and to bring new light in both directions.

Hinduism has been generally considered to be a pre-Aryan, or at least a non-Aryan religion, but nevertheless its holy texts are mainly in Sanskrit. *The religious terminology of Hinduism must, then, have been translated into Sanskrit from some other language.* But it is impossible to translate a religion without obscuring it, for words are bound to lose connotations which their equivalents in the other language do not have, especially *homophones*. Rendering of the original terms in several different ways may help but probably also cause confusion as each of them may later become independent and be interpreted on the basis of the new language. Searching clues from such apparent synonyms, probable mistransla-

tions, or partial translations which seem to make no sense in Sanskrit, we try to rediscover the original Dravidian terms which would give deeper significance to the religious concepts of Hinduism, and which, of course, are of vital importance for the understanding of the Indus inscriptions. The script itself offers invaluable help and means of control to this work.

I shall illustrate this by an example and a parallel from another ancient civilization. One of the greatest deeds of the Hindu god Kṛṣṇa-Viṣṇu is the slaying of the demon called Madhu : hence his names Madhusūdana and Mādhava. Madhu is Sanskrit and means " honey ", which at first sounds rather strange as the name of a mighty demon. But in Dravidian *tī*, *tīṉ* " sweet, honey " is homophonous with *tī* " evil ", and when we realize that the god of evil is Kāma, " Desire ", the god of love, we can also understand why " honey " was chosen to be translated of the two homophones. In another version of the same legend, the demon slain by Kṛṣṇa-Viṣṇu is Pañcajana, a snail, which, even if it be poisonous, is even more baffling as the personification of the evil. But the homophony between the Dravidian words *nattu* " to put out light, eclipse ; poison " and *nattu* " snail " gives sense to the myth (where the demon is Kāma = Rāhu, the eclipse planet), the existence of which gave no choice to the translator. The Biblical story of the creation of Eve from Adam's rib is quite parallel. In Hebrew Eve is *ḥawwā*, which means " she who makes live " (mother), and " rib " is *ṣēlā'* : the story makes sense only in Sumerian, where the word for " to make live ", *ti*, and the word for " rib ", also *ti*, are homophonous. The story has actually been traced in the earlier Sumerian paradise myth which has survived.[3]

B. Results

1. *The script* is logosyllabic, pictographic writing, which is to a great extent based on the rebus principle. This, as well as affinities in the form of the signs, suggests that the inventors of the script have known the earlier Sumerian, Egyptian and Elamite scripts, or at least one of them, and that the Chinese script may have been influenced by it. Excluding the graphic variants, around 300 different fairly stylized signs are known ; this number includes ligatures of basic signs, numerals written with vertical strokes, and a few fairly abstract phonetic indicators. Determinatives occur. The signs appear to have only one phonetic value, but may have several semantic values. The direction of writing is usually from right to left.

2. *The language* is an early form of Dravidian, called by us "Proto-Dravidian". It appears to be very close to the South-Dravidian, especially Tamil, and decidedly younger than the parent language of all Dravidian tongues. Only alternations which may occur within one and the same word (DED entry) are attested to be allowed within homophones (cf. A 9): ă/ā, ǐ/ě, ǔ/ǒ, ăi̥/ěi̥, i̱/ḷ, *-ṇ/-ṉ*, *m-/v-*, and a difference in the vowel of the accentless syllable(s). The theory that the inflexional suffixes of Dravidian have developed from originally independent words is confirmed by the evidence of the Indus inscriptions. Cf. also C II.

3. *The contents of the inscriptions* consist mainly of proper names of individuals (mostly of theophoric type) and of gods in the genitive case, and of titles of high officials and names of institutions in the nominative, stating the owner of the seal and of the goods sealed with it. A minor group of seals comprises dedications (of women and other objects) to gods, whose names are in the dative. Of non-seal inscriptions mention may be made of votive tablets with gods' names (in the dative or in the genitive followed by a denomination of the devotee).

4. *The iconographic devices* on the seals consist mainly of animals representing gods and apparently used as totemic emblems of clans, as in later Indian seals. Thus the shorthorned *Bull* seems to represent the Hindu god Śiva as in classical Hinduism. Śiva's vehicle, the bull Nāndin, is often depicted on the seals of Śaivite rulers. The *Antelope* (*kaṭamā*, *kaṭavu*), also a holy animal in India, is the "unicorn" of the Indus seals and represents the Hindu god Viṣṇu (*Kaṭavuḷ*). A *Ram* or goat seems to represent the Hindu god Brahma (Prajāpati), as in later religion, and the composite animal with heads of ram, antelope and bull should then represent the Hindu trinity (Skt *trimūrti*) of Brahma, the creator, Viṣṇu, the protector, and Śiva, the destroyer.

A *Tiger* is depicted on the seal which according to the inscription belonged to the high-priest of the Mother goddess. A half-lady, half-tiger, with snakes in her headdress, depicts the goddess of war (Koṟṟavai), the Hindu goddess Durgā who rides on a tiger or lion. This is proved by the scene which on one seal accompanies the figure: the same lady holds the hands of two men who are killing each other with spears. Her Sanskrit name Kāḷī "the black lady" (cf. Tamil Māyavaḷ) is derived from Dravidian **kāḷ* "black", which is homophonous with *kāḷai* "warrior, battle, war".

The composite *Monster* with the trunk of an elephant, hind-quarters of a tiger, etc., depicted on many Indus seals resembles *yāḷi*, the mythological lion-faced animal with elephantine proboscis and tusks known from early Tamil literature and also used as a totemic emblem.

A *Crocodile* with a fish in its jaws represents Rāhu, the demoniac planet causing the eclipses, and identical with the Hindu god Kāma, who rides on a crocodile. In the Indus script the signs depicting " fish " stand for the word " star ", these two words being identical in Dravidian and the stars being thought of as fish swimming in the ocean of heaven. In the Indus script, as later in Tamil, Kāma is called *Mīṉavaṉ* : he is fishing the stars.

Through a homophony between the respective Dravidian words, the *mangers* placed in front of most animals (even such as tigers) probably denote " devotion, worship ".

The fairly common scene of a human figure squatting in a tree and stretching something in his hand towards a tiger which is watching below, closely resembles a topos in the early Tamil literature : Young maidens of the Kuṟavar tribe shout " tiger, tiger " (*vēṅkai*) when plucking the flowers of the kino tree (*vēṅkai*).

Famous elaborate seals with scenes of *anthropomorphic* deities have, according to the inscriptions, belonged to the high-priests of the main gods and apparently been hereditary. The iconography of these seals repeats the textual message pictorially. The figure surrounded by wild beasts and wearing buffalo's horns, an emblem of death, depicts the Hindu god Śiva (cf. his Vedic epithets *paśupati* " lord of beasts " and *bhūtapati* " lord of the evil spirits of the dead "). The god inside the pipal tree is the Hindu creator god Brahma (Bṛhaspati), to whom this cosmic tree of creation is sacred. The seven figures wearing a hairdress (*juṭṭa*) characteristic in later India of ascetics and sages (*juṭṭi* " wise man "), are his seven children, the stars of the Great Bear called " the seven sages ". (Cf. also section 7.)

5. *The purpose of the seals* is clear from their contents, the extant sealings which evidence their being attached to bales of goods and to mouths of jars, and from the early Tamil Sangam and epic literature, and such important Sanskrit texts as Kauṭilīya Arthaśāstra, which bear testimony to a parallel use of seals in later times. The seals were evidently used in controlling trade and administration, especially in connection with levying of tolls and taxes.

6. *The social structure* of the Indus people appears from the seal texts to have been to a large extent *theocratic*, the temples (including the great baths) playing an important role. These temples, and also the granaries, were sacred to individual gods. For the structure of the (priestly) hierarchy we can name so far high priests (*āṉ* "servant of God"), priestesses (*taṅkai*), and clergy (*tampi*). In addition to the priests, there was also a 'secular' power represented by a king (*āḷi*), and a number of vassals with military power and the right to collect taxes (*tanṭa*). The king is the divine protector of the earth and righteousness in human form. He has to act in accordance with the movement of the stars, assisted by a royal astrologer (*pārppāṉ, kaṇakkaṉ*). The concept of ritual purity that is so important in the later caste system is likely to derive from the Indus society (cf. paragraph 7 at end).

7. *The religion* of the Indus people is *an early form of Hinduism, with prominent astral elements*, something that was unexpected, but natural considering their occupational activities, and their need for a calendar, both for warning of floods and for navigation.

The highest god of the Indus people was Kaṭav-uḷ, the all-pervading (*kaṭa*) and victorious (*kaṭa*) reality (*uḷ*), the god Viṣṇu of later Hinduism, who steps through the three words and penetrates everywhere. He is the divine protector of the eternal law of truth (the cosmic order), and of his wife, the Earth. Against those who violate his law he is fiery as the sun, and destroys them with the thunderbolt, his weapon, and for the good and righteous he is benevolent as the moon, the king of the stars, and the receptacle of the juice of life and immortality. The races of the human kings, his earthly representatives, are derived from these two foremost manifestations of the celestial light, the sun and the moon. Just as the god fertilizes with lightning (conceived as ploughshare) and rain his wife the Earth, so is the human king responsible for the welfare of his country. He too has to protect the righteousness (Skt. *dharma*) and good people by punishing the wicked (Skt. *daṇḍanīti*).

A mythic drama par excellence is the victory of this god of light and good over the demon of darkness and evil, the Hindu god Kāma, "Desire" (also in Buddhism the god of evil), the bodiless god of sexual love riding on a crocodile. Kāma is the bodiless planet Rāhu, causer of eclipses, who, though severed from his body by Viṣṇu when he tried to extinguish the sun and to steal the ambrosia (the moon), was made immortal by the liquid he had tasted.

The myths of Viṣṇu's incarnations are repetitions of this same mythological action. It has already been shown (A 10) that the homophones for different Dravidian words for "evil" created the mythological demons Pañcajana and Madhu slain by Viṣṇu in his Kṛṣṇa incarnation. But also the homophones of the name of the god himself, *Kaṭav-uḷ*, are of the utmost importance for the understanding of his nature. *Kaṭavu* "antelope" has been mentioned above (B 4). This animal fits with Viṣṇu's being the god of swiftness (cf. also his epithet *ekaśṛṅga* "unicorn"). Viṣṇu's boar incarnation is made natural by the homophony between the words *uḷ* "being, existence, truth, reality" and *uḻ* "to plough, to root up as pigs", which is also appropriate to his being the husband of the Earth. (This aspect is present also in his incarnation as Rāma, the husband of Sītā, "furrow".) Another homophone, *uḷ* "inside, heart, mind, thought, soul", may explain the mystic equation of the god (world-soul) and the individual soul (Skt. *ātman*), which is the essence of the Upaniṣads. The first part of his name *kaṭa*, "to pervade, cross", is homophonous with *kaṭa* "churn" (=the Indus sign), which no doubt has given rise to the myth of the churning of the milk ocean.

The planets, the original Dravidian names of which refer to their colours known also from later astronomical literature, represented the other main gods. The golden planet Jupiter (Skt. Bṛhaspati) is identical with the creator god Brahma of later Hinduism (called also Bṛhaspati in the Vedic literature). Many other names and concepts related to Brahma in Sanskrit, such as Prajāpati, Vācaspati and prāṇa, can be traced back to one and the same Dravidian word *uy*, *uyir* "vital breath, life, creation, voice", which may precede the word *uṭaiyavaṉ* "lord of . . ." to form the god's foremost epithet in the Indus inscriptions. He is the golden egg from which the worlds according to later literature were created. According to other conceptions, he was the cosmic fig tree of creation, or the golden cosmic mountain Meru.

The red (*ceva*) planet Mars, still called *cevvāy* in Tamil, is the Hindu god Śiva. In the Vedic texts this originally Dravidian name has been translated into Sanskrit Rudra, which also means "red". The nature of this formidable god fits very well with the character of the blood-coloured Mars, the star of ill omen par excellence. The astral origin of Rudra is reflected in his Rigvedic epithets "the red boar of the sky" and "the asura of the great sky".

The green planet Mercury, called Buddha "Wise" in Sanskrit, is the god of science, Gaṇeśa.

The white planet Venus is the Hindu god Balarāma (alias the serpent Śeṣa on which Viṣṇu reclines), an incarnation of Kaṭavuḷ (Viṣṇu), born of his white (*vāl*) hair (*vāl*) and having the plough as his weapon. On the seal (2641) of his high priest this planet is depicted as a star-fish (cf. Tamil *uṭu-mīṉ* or *naṭcattira-mīṉ* "*star*-fish") with head of antelope : "the star of Kaṭavuḷ".

The black (*mai*, *māy*) planet Saturn is the god Kṛṣṇa (*Māyōṉ*), the younger brother of the white god, the two forming a complementary pair (Balarāma-Kṛṣṇa, Rāma-Lakṣmaṇa, Nara-Nārāyaṇa, Arjuna-Kṛṣṇa). Through homophony his name (*mai*, *māy* "black" =*mēy* "to graze, pasture, shepherd") makes him a pastoral deity, and also (in addition to their forming a pair) later merges him with the Supreme Being represented by his elder brother (*mai*=*m'y*=*mey* "truth, reality, soul, body").

Constellations of planets were also considered as deities. The pantheon of the Indus people further knew, besides the goddess of war, also the youthful Dravidian war-god Murukaṉ (Skt. Skanda, Subrahmaṇya), who was associated with the Pleiades ; and the divine musicians.

As may be seen from the iconography of the seals (above B 4), the gods were already associated with certain animals, on which they were thought to ride according to the later mythology : an idea which now seems natural as the gods were stars moving in the sky, and in later representations of the planetary deities these "vehicles" are also depicted.

The gods' names mostly occur on the Indus seals preceded by epithets the most common type being those formed with *uṭaiyavaṉ* "lord of . . ." (Skt. *-pati*, *-īśa*). From the evidence we have they may be expected to coincide to a large extent with the epithets known from later sources. Some of them can help us to a comprehension of the symbolism behind the emblems associated with the gods in later iconography. Thus for instance the wheel (Skt. *cakra*) of Viṣṇu and *cakravartin*, the king, Viṣṇu's earthly counterpart. In the Indus script the potter's wheel (*āḻi*) stands as the rebus symbol for "ruler" (*āḷi*).

The astral nature of the proto-Dravidian gods fits extremely well with the popularity of astrology, especially in the Dravidian South India. It also connects the baths of the Indus sites with the temple tanks and holy rivers of later Hinduism. In Hindu ritual

bathing should be performed especially on certain conjunctions of planets, eclipses, etc. From the inscriptions it appears that the concept of ritual purity (*maṭi*) was very important in the Indus religion.

8. *Philosophy, sciences and literature.* The phonetic structure of the Dravidian languages is very simple, and therefore they possess an unusually great number of totally or nearly homophonous words with different semantic meanings. As may be seen from the preceding chapter, this is not only reflected in the nature of the script of the early Dravidians which is based on homophony principle, but also in their religious thinking, where linguistic speculation plays a role of the utmost significance. Only now we can fully understand the background of classical Indian philosophy, the speculative thinking of the Brāhmaṇa and Upaniṣad literature, which is based on hidden connections between different kinds of things. The term *Upaniṣad* itself seems to be a translation of the Dravidian *īṭu* which means both " equation " and " to set down ".

This early linguistic speculation explains also the interest in the study of language, which in ancient India developed to a very high stage : the legend of Pāṇini and Śiva, and the eightfold division of his Sanskrit grammar also point to earlier Dravidian traditions. Also astronomy, mathematics, and other sciences (medicine, erotics, politics, architecture etc.) of classical India are certainly much indebted to traditions originating in the Indus cities. Both the name (Nūl=Sūtra) and the concise style in which the systematic scientific treatises are written in Sanskrit, must be based likewise on Dravidian models.

The essence of Hinduism, the Great Epics and the Purāṇas, date in their present form from the post-Vedic period. But their prototypes are referred to already in the Upaniṣads, and their mythology in part at least can be followed back to the cosmogonic hymns of the Ṛgveda and now also to the Indus inscriptions.

9. *The early history of India.* Coming probably from the Iranian plateaux to India, the Dravidian peoples settled in NW India and Dekkhan. In the middle of the third millennium B.C. the Dravidians[4] founded in the Indus valley well-planned and fortified cities and towns, cultivating the soil irrigated by floods and trading by sea with Mesopotamia. Their country was known to the Sumerians as Melahha, which probably stands for Dravidian Mēl-akam (pronounced *aham*) " Western Country ". By 2000 B.C.,

the Indus civilization had reached the Ganges-Yamunā basin (Alamgirpur) and Saurashtra and Gujarat (Lothal), and fortified ports had been built along the sea route to Mesopotamia on the Makran coast.

Around this time violent floods disrupted the economy and devastated the big cities on the Indus. This process was eventually completed by the Aryan conquerors coming in increasing numbers from the West. Part of the population must have moved to the South occupied by Dravidian-speaking neolithic cattle-keepers bringing with them reminiscences of floods submerging ancient cities, but a great part must have remained in the area (Dāsas or Dasyus and their cities in the Rigveda). More distant branches of the civilization survived some centuries longer, but about 1700 B.C. the Indus civilization was at an end. It was probably in Gujarat that the Aryans at a later stage of their conquest again came into contact with hostile people, who could not properly pronounce their language and who were called *milakkha* (thus the Pali form, Skt. *mleccha* seems to be hypercorrect), which word was later used as a common noun for " barbarian " in Indo-Aryan. In circumstances comparable to those of the Mycenaean Greece, the Indus script went into oblivion.

The Aryans, although in all probability fewer in number, by their military force subdued the Dravidians. They intermarried, and the Dravidians took over the language of the conquerors, which with their political power became the medium of culture. Their own substrat language, however, deeply influenced the Sanskrit language, and the marked difference between the complicated consonant clusters of the Sanskrit and the simple clusters of the Dravidian, already reflected in *mṛdhravāc*, the Rigvedic epithet of the Dasyus, resulted in the coming into being of the Prākrit languages. The Aryans on the other hand took over much from the religion and civilization of the Dravidians. We have a good parallel in the Akkadian conquest of Sumer.

Though the Hinduistic spirit to a large extent pervades the Vedic literature, especially from the Brāhmaṇas onwards, certain important aspects of the Dravidian religion like astrology and idolatry were systematically censored. This, as well as the shift of the language, obscured many religious concepts. Hinduism, however, continued to be the religion of the main bulk of the population and eventually came into surface, first in Upanisadic, then in Buddhist and Jainist, and at last in its classical form, absorbing the Indo-European religion of the Aryans.

C. Proofs

I. Internal probability

1. The methods used are in accordance with the methods successfully used in the decipherment of other scripts.

2. The individual sign interpretations fulfil in most cases all the requirements imposed by the method.

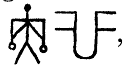
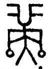
3. The mathematical probability of getting by accident over sixty such interpretations by applying the method to a wrong language is exceedingly small.

4. The individual interpretations fit together, forming a whole which makes sense.

5. The contents of the inscriptions thus read correspond to what can be expected on the basis of the nature of the inscribed objects and parallels elsewhere in the ancient world.

6. The contents not only fit the later Indian civilization but also explain some difficult problems, as was, if not expected, at least hoped the decipherment would do.

7. The system of writing discovered is similar to that of other contemporary scripts.

8. There are internal corroborations, such as the signs for the words *kō-il* and *kō-aṭṭa* (see Progress p. 5). Cases where "exception proves the rule" may also be mentioned, for example the occurrence of the signs denoting genitive and plural suffixes a few times side by side , although the genitive plural is usually expressed by a ligature of these two signs . At first we erroneously took these exceptional occurrences to indicate the order in which the ligature is to be dissolved, but this led to a linguistic impossibility. We were forced to re-examine the matter and discovered that the sign in these cases stands for the word *kaḻu* "bath", preceded by a god's name in the genitive singular, quite parallel to words for temples and granaries. This gave a striking confirmation to the reading of the plural sign and revealed an important aspect of the nature of the script.

9. There seems to be no evidence to disprove the correctness of the Dravidian solution.

10. Conversely, everything combines to point in the same direction and reinforce the Dravidian hypothesis.

11. Other scholars have quite independently come to the same conclusions on specific points as we have.

II. Linguistic proofs

12. In a combinatory analysis (A 2 to 4) the linguistic type of the language of the Indus inscriptions appears to be agglutinative; of the languages known from the Indian subcontinent only the Dravidian languages belong to this type.

13. The declension paradigm discovered fits to the declension of Dravidian.

14. The alternation of a zero suffix and the genitive suffix which is attested in the Indus inscriptions is a characteristic of Dravidian.

15. The decipherment displays an earlier stage of development of Dravidian, which corresponds to expectations (etymologies of suffixes).

16. The word order is the same in Dravidian and the Indus inscriptions.

17. The homophony laws are in accordance with the morpheme structure of Dravidian.

III. Extralinguistic proofs

18. On some seals the message conveyed by the inscription coincides its pictorial expression through the accompanying iconographic scene (B 4).

19. The numeral system of the Indus people, evidenced by the ratio of their weights and the frequency distribution of the numeral signs in the Indus script, is octaval (mixed with decimal), like the earlier Dravidian system evidenced by linguistic testimony. But the Sumerians had a sexagesimal (mixed with decimal), the Mundas a vigesimal, and the Aryans a decimal system. The octaval tradition can also be traced in Hinduism and classical Indian culture. That the number four should be considered good in dice playing, which was very popular in the Indus cities and in the Hindu Epics, makes good sense in Dravidian: *nāl* "four"=*nal* "good".

IV. The historical probability of the Dravidians being the bearers of the Indus civilization

20. Dravidians were present in the area of the Indus civilization at the time of the Aryan invasion and thereafter (linguistic testimony of the Rigveda, Prakrits, and Brahui).

21. The Dravidians have in historical times had a high and original civilization (which *e.g.* the Mundas lack).

22. The early attested seafaring nature of the Dravidians fits with the seafaring nature of the Indus people.

23. The number of Dravidian speakers is statistically very remarkable (over 100 millions today, as against *e.g.* the ca. 5 million Mundas, the next biggest non-Aryan language group in the Indian subcontinent).

24. The Tamils have legends of flourishing cities that were in ancient times lost under the ocean.[5]

25. Hinduism is a pre-Aryan religion abounding in referenees to Dravidian.

D. CRITICISM

1. *Objection :* It is not possible that a script is based on the *rebus principle.* Or : Why is a sign to be read with the rebus value, instead of taking the ideographic meaning?

Answer : For reasons already given above (A 5, B 1, B 8), it is in our opinion quite conceivable why the Indus script is to such a great extent based on the rebus principle. Of fundamental importance here are the facts that the rebus principle was the basis of all writing systems of this time, making it possible to write also abstract concepts. Compared with an ideographic writing system it is much less ambiguous and works with a far lesser number of signs making thus the writing easier. In the particular case of the Indus script, it also fits to the structure of the language extraordinarily well. The use of a sign in its primary (pictorial) meaning besides the extended (rebus) meaning is not at all precluded, but actually attested (" of the ship " in a seal found in Mesopotamia). The rare occurrence of the primary values is only due to the nature of the texts.

2. *Objection :* It is possible to play with ***homophones*** in any other language. Or : There is any amount of homophones in Dravidian, and it is very easy to find always one with a suitable meaning.

Answer : We invite our critics to build up a different set of homophones of the same signs in any language, observing our methodical principles (A 7, A 9), and to test our proof C 3.

3. *Objection :* There is a *2000 years' gap* between the Indus inscriptions and the earliest recorded Dravidian. " In such a long period there must have been considerable linguistic development, and if the Indus language was Dravidian it must have differed considerably from the existing Dravidian languages."

Answer : First of all, the gap is only about 1500 years : the latest Harappan layers of Lothal, Kalibangan etc., date from the 18th century B.C., and the oldest Tamil inscriptions from the third or second century B.C. Secondly, we are inclined to think that there is no gap at all, for loanwords in Indo-Aryan from Dravidian are found in increasing numbers from the Rigveda onwards (Vedic, Classical Sanskrit, Pali, Prakrits, Epic Sanskrit) ; and also in the field of religion it is possible to demonstrate a continuity from the Indus times until the present day. In the third place, Tamil has changed surprisingly little during the two millennia we can follow its development, in spite of strong Sanskrit influence, which has mainly confined itself to loanwords. There is no need to suppose a more radical change earlier.

" Fortunately the differences between the various Dravidian languages are not so great as to render dubious the reconstruction of the primitive form of the language, and the form of words met with in the loanwords in Sanskrit does not materially differ from that which is arrived at by the comparative study of the existing Dravidian languages. It is a characteristic of the Dravidian languages that they have not evolved with the same rapidity as Indo-Aryan " (Burrow). The conservative character of the agglutinative languages is shown *e.g.*, by Finnish, which has in spite of being a literate language only some 500 years, preserved loanwords from proto-Aryan in exactly the same form as in which they were borrowed 4000 years ago.

4. *Objection :* " The later spread of Indo-Aryan over the greater part of the subcontinent is likely to have submerged a much greater variety of languages and languages families than the number which has managed to survive. It would be possible that the Indus

language was connected with *Buruśaski*, or that it belonged to a family which has become *extinct*. The *Munda* languages can probably be left out of account, since their location is in Eastern India, and their connexions are with South-East Asia."

Answer : As regards the Mundas we consider their presence in the Indus cities as a lower class to be possible. The considerable part played by prefixes in the inflection of the Burusaski and the small number of its speakers do not make it a likely candidate to be connected with the language of the extensive Indus civilization (cf. A 4 and C 11). There is no evidence for any unknown language group having been submerged by the Indo-Aryan but all the more for Dravidian. For we *have* means to identify at least the main linguistic substratum (which is Dravidian), namely, the loan words and the development of the Indo-Aryan itself (cf. D 2 and B 9).

•5. *Objection :* " It is wrong to assume ' all the *suffixes* of the oblique cases in Dravidian developed from words which had once been independent '. In all languages there is a basic nucleus of terminations which cannot be explained in this way, and wherever the case is formed by means of postpositions (originally independent words), these are demonstrably of secondary origin."

Answer : There is a difference of opinion in this matter between the foremost Dravidian experts themselves : " A proper comparative and historical study of the Dravidian declensional system has not yet been done ". In principle, however, it seems that if the development of a postposition into a suffix is demonstrable in historical times, it is very likely to have taken place also in the case of older suffixes (which may of course go back to more or less remote antiquity), especially as this process is evidenced in other agglutinative languages. Besides, a universal tendency of suffixes is to become shortened (**kaḻi*>*kaḷ*>*ka*, *k*, *ḷ*), not to become longer (*k*, *ḷ* >*kaḷ*), as has been suggested by our critics. It seems therefore a reasonable supposition to see an etymology of a suffix in a word that phonetically and semantically would fit to it, as in *kaḻi* " much " for the plural suffix *kaḷ*.

6. *Objection :* " There are items in DED concerning which it is not easy to say for certain whether they are *borrowings from Indo-Aryan* or vice versa."

Answer : This is of course a point that must be kept in mind. We can see only one criterion which can be confidently used to ascertain of the origin of a word, namely to examine whether it

has an Indo-European etymology or not: if not and if it is well represented in both groups, the odds are for Dravidian origin, especially if it denotes a specifically Indian thing.

7. *Objection :* " When there is no trace of words shared by two or more South Dravidian languages in old literary texts, particularly in Tamil, such words cannot be assigned with confidence to the primitive language. Also, the main South Dravidian languages have borrowed from one another to some extent, so that a common item does not necessarily represent a common inheritance. It is, therefore, necessary to consult not only DED, but also the historical dictionaries of each language, to ascertain *whether the word is really ancient.*"

Answer : Unfortunately the historical dictionaries available are for from complete, and there may be special reasons, such as stylistic, for an omission of a particular word in literary texts. Whatever value may be attached to glottochronology, Tamil may have lost some words which have been preserved in other Dravidian languages spoken by peoples whose geographical surroundings, cultural level, and social structure are different from those of the Tamils. If a word is attested in several Dravidian languages but not in any other languages, what is its origin? Admitting that such words as described above provide much weaker arguments than words attested in all Dravidian languages and in the most ancient documents (cf. A 7), we are not prepared to exclude wholly the use of such words, especially as it has become clear that the Indus language is much younger than the primitive Dravidian. With a view to the absence of the necessary preliminary work, the short comings of the DED (stressed by our critics), and our own limited knowledge, criticism from Dravidian specialists is most welcome. Discussion and further research is the only way to settle the problems.

8. *Objection :* The identification of *pictures* is a weak point in the decipherment.

Answer : This may to some extent be true, though we have certain means of avoiding subjective guesses (cf. A 10). Fortunately the intended meaning in many cases becomes clear from the different contexts and makes a verification possible. In interpreting a pictogram the limited possibilities of drawing a recognisable picture must also be kept in mind. For example, our interpretation of the pictogram (variant) as depicting the word ***koṭi***, ***koṭu*** " point, tip, peak of mountain " and standing as the rebus

sign for the word *koṭu* " to give " used as a postposition to form the dative, ([6]) has been criticized by pointing out that " the meaning ' point or blade of arrow ' is conspicuous by its absence " in the corresponding DED entry. But " point " could not be drawn otherwise, since there was also a sign ∧ depicting " thatched roof ".

It has also been pointed out that some of the signs may be symbols. This is certainly true. Apparently the rebus signs were selected so that they would, if possible, be semantically associated with the conception to be expressed, and in course of time the writing made the rebus objects into symbols (wheel=king). Thus the later iconography and symbolism will also provide important clues to the identification of the pictograms. Besides it is not likely that *all* the words of a language can be expressed through homophones.

9. *Objection :* There is no *toponymic* evidence of the Dravidians in the region of the Indus civilization.

Answer : This is a topic that has been much neglected, but it does not follow that the evidence therefore should be negative. So far there are only amateurish studies, but interesting possibilities ; cf. L. V. Ramaswami Aiyar, " Dravidic Place-Names in the Plateaux of Persia ", The Quarterly Journal of the Mythic Society (Bangalore) XX : 1, 1929, 49–53.[7] In this connection we wish to draw particular attention to the fact that the place names connected with the Hindu mythology are almost exclusively in the region of the Indus civilization : the river Sarasvatī (the goddess of wisdom, Brahma's spouse), Ganges (Śiva's spouse), the river Yamunā/Kālindī (the abode of the serpent Kāliyā subdued by Kṛṣṇa), the city of Mathurā (specifically connected with Kṛṣṇa, probably derived from Dravidian Madurai), Himalaya (the abode of Śiva and other gods, where it is tempting to see the Dravidian word *malaya* " mountain ").[8]

E. Prospects

1. We are preparing a critical edition of all available Indus inscriptions and a concordance recording, with entire context, every occurrence of every sign combination. This edition and concordance will be accompanied by a classified sign list recording all graphic variants, and is due to appear in 1970 as no. 5 in the Monograph Series of the Scandinavian Institute of Asian Studies.

2. Our next endeavour is to produce a monograph explaining more fully the hitherto-achieved results and giving more detailed documentation. This work should appear in a year's time.

3. A Tamil scholar, R. Panneerselvam, is now assisting us in Copenhagen. He is at the moment doing important preliminary work by preparing a comprehensive collection of proper names and names of gods (with their titles and epithets) occurring in Tamil inscriptions and early Tamil literature.

4. The epithets of the gods in the Indus inscriptions are likely to prove one of the most important clues in the sequel, and also to give the most interesting results. A fresh study of Hinduism, also from other points of view, with regard to the achieved results and to all the various traditions (Vedic, Buddhist, Jainistic, Classical, Tamil) is one of the most urgent tasks now. We are really fortunate in possessing so many different traditions, which make it possible to see what is really old and to understand concepts which on the basis of one tradition alone might be obscure.

5. Archæology could throw more light on the Indus civilization and its script. Let us mention here only the unexcavated centre of the citadel of Mohenjo Daro lying under the Buddhist stupa. Finding of Sargonite and Ur III dynasty texts in Mesopotamia would certainly be of tremendous significance, and might even bring to light bilingual texts or sign lists of the Indus script. Something ought to be done also for clarification of the stratigraphy and provenance of the inscriptions so far discovered.

6. The need for more research on Dravidian comparative and historical linguistics has already been mentioned, but may be repeated here. A word concordance to the earlier Tamil literature and inscriptions is one of the foremost desiderata.

7. There are of course many other things that can and must be done for further research of the Indus script. The help of other scholars is badly needed.

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FOOTNOTES

[1] Due to inaccurate coding of our preliminary text, our first statistics recorded a few occurrences of the suffix signs at the beginning of an inscription, but these were statistically meaningless and we were aware of the defects of our text. A re-examination of the material has left us with only two or three doubtful cases out of a thousand or more instances.

[2] This word is probably derived from the word meaning " cobra's hood ", reconstructed **pena*, **peta*, **penta*, **pentika*; cf. DED(S) 3180 and the borrowings into Sanskrit etc., *phana*, *phata* " hood of cobra ", Pali *phanaka* " an instrument shaped like a snake's hood, used to smooth the hair " (PTS), Prakrit *phanaga*, *phaniha* " comb ". In Tamil other words for comb have sent this word into oblivion, but the base word has been preserved. As regards the pictogram , it would have taken more space and perhaps not been so clear to draw a picture of the double-sided comb.

[3] Cf. S. N. Kramer, *The Sumerians*, Chicago 1963, p. 149.

[4] Besides the Indus civilization, the Kulli culture of the Indus valley of this time seems also to be Dravidian.

[5] The dates connected with the legend of Tamil sangams (academies) are of course fabulous and cannot be taken literally, as some of our critics have urged us to do.

[6] Cf. Sumerian BA " to give " : whence this meaning?

[7] We are indebted for this reference to Dr. M. Andronov.

[8] Is the Indus river with its fertile alluvial soil the spouse of the main god Viṣṇu : Śrī-Lakṣmī-Gaurī, the goddess of welfare and ripe corn intimately connected with mud?

Harappa Script Decipherment—
Fr. Heras and his Successors

P. JOSEPH

Early attempts and their Drawback

Ever since the results of the Indus valley excavations had been announced, scholars tried to read the Harappa script. Quite a few had come out with their solutions to the riddle before Fr. Heras began his work in the late thirties. More had followed by 1953, when Fr. Heras' volume I of "Studies in Proto-Indo-Mediterranean Culture", in chapter I of which he gave a resume of his reading of the script, saw the light of day. The last[1] of early attempts is quite formidable. It includes such names as Waddell, Pran Nath, Langdon, Gadd, Flinders Petrie, Hunter, Meriggi, Swami Saṇkarananda, Barua, Karmarkar and Hrozny.

The main drawback of these attempts was the lack of statistical analysis. In the context of non-availability of bilingual records the only way to obtain a clue to the nature of the language involved was to submit the written documents to structural analysis. Otherwise any language could be read into any script.

Fr. Heras' Attempt

The first person when the line of approach of the previous attempts struck as inadequate and who, hence, applied a new methodology to unravel the mystery of the Harappan language was Fr. Heras. His work stretched over almost a couple of decades; during which he had contributed to various journals, both at home and abroad, as many as thirty articles. They were meant to be collectively a curtain-raiser to the *magnum opus* that had grown far beyond its original conception. What begun as merely the decipherment of the Harappa script ended with not only that topic but others, dealing with connections between Harappa and the outside world in a grand cultural sweep that extended from India via the Mediterranean basin to the British Isles. Unfortunately the bulk of the material, including a com-

prehensive discussion of the script decipherment problem itself, is still in manuscript form, awaiting posthumous publication.

Nature of the Script

Fr. Heras began his study of decipherment by tackling the nature of the script,—to decide what stage it had reached in its development. The majority of the pictures, though conventionalised in some cases, were on the whole easily recognisable, as depicting particular objects, whose meaning could be expressed straightaway without much difficulty. There were other symbols that evoked no objects naturally or conventionally. Hence their significance could have been only phonetic,—where sound determined the sense of the signs. For guidance specially in regard to the phonetic signs Fr. Heras went to the Sumerian,[2] Egyptian,[3] Hittite[4] and Chinese[5] sign-lists, particularly archaic. The Harappa script, he observed, was most akin to the earliest, quite short-lived specimen of Sumerian writing found only on the Kish tablet.[6] The Kish script was pictographic. So was the Harappan. But it had already become partly phonographic. Hence he called it pictophonographic.[7]

Each symbol in this picto-phonographic script must have represented a full word and not a syllable. A comparison between the number of signs in the Sumerian and the Harappa scripts, he thought, seemed to confirm his view. The classical Sumerian writing,—other than the short specimen on the Kish tablet—had already become partly syllabic and in the Uruk period had as many as 960 signs.[8] However, there had always been a tendency to simplification of script. The number of signs gradually lessened and in the Akkadian period[9] there were only about 600 signs. In comparison, the Harappa script had,—omitting composite signs—around 360 basic ones. Here Fr. Heras took into account the possible existence of more signs than disclosed by the seals,—which apparently had a limited purpose as marks of ownership, talismans and, perhaps, educational aids. The extra signs could have been on palm-leaf documents that failed to survive. Even so, the Harappan symbols, he surmised, could not have been as many as those in the Akkadian period. To the possible objection, that the Harappan script wherever its origin might have been, was

possibly in so advanced a syllabic stage that it had come to have only about 360 signs and, hence, must have been very much post-Akkadian, Fr. Heras would have replied that the commercial and cultural contacts with Summer proved that the Harappa civilisation was Akkadian and pre-Akkadian but hardly post-Akkadian,[10] since both civilisations collapsed in the days of Sargon's successor.

In view of the lack of scientific stratigraphy in the early Indus valley excavations it is not possible to take count of the script symbols in different periods and thus to judge the process of script development. And yet Fr. Heras felt that, as apparently during its entire life-span the script showed not many marks of change in the shape of symbols, each of them must have been used to express a full word. Had the script been syllabic, the signs would have tended to simplification even in shape,—apart from number—pretty fast.

Nature of Language

Having settled the question of the nature of the script, Fr. Heras took up the more important—because more difficult—task of deciding the nature of the language. In this he owed a great deal to Hunter's painstaking effort of tabulating the signs and sign-combinations. Whereas Hunter had stopped short of enquiring into the language as disclosed by his statistics and merely assumed that it was Aryan, Fr. Heras pushed the enquiry to its logical conclusion to see if the structure of the sign-groups themselves provided an idea of the kind of language that was written with those groups.

While analysing the inscriptions,[11] he noticed that certain signs were often followed by certain other signs. When he had dealt with a sizable number of inscriptions he surmised that the signs that were followed by the others, very limited in number—in fact, a couple—must have been main ones and the latter suffixes. Since the suffixes varied they should have had differing functions. The only languages where this kind of arrangement, in which suffixes, representing full words,—the study of the script had shown each sign stood for a whole word and not a syllable,—were agglutinated to main ones, existed, were those of the Dravidian

group. He definitely ruled out other agglutinative languages like Sumerian, since in his view, apart from certain peculiar non-dravidian structural features of these languages, the Sumerian and other allied west Asian cultures and languages too originated in the Indus valley.[12]

He took up the suffixes for further study. One of them U [13] not only followed signs and sign-groups but even ended several inscriptions. Sometimes it was followed by other signs. Fr. Heras decided it must have been the sign of the possessive or genitive, the sign or group preceding it standing for the possessor and that following it for the possessed. Incidentally the sign U apparently began a few inscriptions. This was obviously diagnostic and showed that such inscriptions had to be read not in the usual way from right to left but from left to right. The sign thus ended inscriptions. In some cases, however, Fr. Heras did find the sign actually starting the inscriptions. In these cases and also in a very limited number, where it ended inscriptions, he decided it was a demonstrative pronoun. Another suffix was the sign || apparently signifying the numeral two.[14] While this sometimes followed certain signs, it also preceded them at other times whereas the other numerals invariably went before the signs. This peculiar behaviour of numeral two showed that it had different functions. When it preceded, it indicated number like the other numerals but when it succeeded it was probably indicative of plurality in the sense of more than one.

Fr. Heras thus isolated case suffix (possessive or genitive) and a number (plural) suffix. The main words, which these suffixes followed must have been nouns.[15] He then read out his sample collection of signs and sign-groups. Felt encouraged, he decided to try out other combinations by carrying on, however, the analytical work and the reading together, so that the reading would check the validity of the analysis and the analysis guide the reading. He took up the same main signs as before and noticed that sometimes they had others preceding them. These preceding ones could be adjectives,[16] participles or other nouns put in apposition with the nouns denoted by the main signs. It might even be that between two noun signs genetive sign was omitted. There were at times several preceding signs standing probably for a whole

phrase.[17] Occasionally a main sign had more than one phrase attached to it. Even, a sign in one of these phrases had a distinct qualificative phrase of its own. He then checked upon other main signs, preceded by a different set of symbols. He tried the main ones out as verbs and the preceding ones as adverbs [18] and even participles. When he had analysed all the then available 1800-odd inscriptions, he felt sure of his original surmise regarding the language. What, however, really clinched the issue and convinced him of the correctness of his mode of approach was the success he had with his supposition regarding the participial phrase[19] preceding a noun. This kind of phrase, very peculiar to Dravidian, does duty for an adjectival clause, which in Indo-European invariably follows a noun. Thus Fr. Heras distinguished between grammatical and synthetical elements of the Harappan language from an analysis of the structure of the inscriptions and concluded that these elements belonged to a language of the Dravidian group.

That language could never have been any of the modern Dravidian ones but their proto-language namely, proto-Dravidian. The agglutinative or polysynthetic character of the Dravidian group of languages and the fact that in this group genetic variations were not too many, possibly because they developed largely within a compact area in close proximity to one another, helped Fr. Heras in tracing words back to their roots, which, he thought, must have existed in their proto-stage.[20]

He was, however, immediately confronted with the problem of vocabulary. If the Harappa script had only 360 basic signs and as each sign stood for a word, Harappan vocabulary, on the face of it, had only a limited range. But the 290 composite signs, some of which at least stood for entirely new words, specially when one or more components were phonetic, added to the vocabulary. Moreover there was the possibility of a word having more than one meaning. This was fully tested during the reading. The choice of the correct meaning depended on the context.

Russian Attempt

After Fr. Heras came Fateh Singh, Ray and Krishna Rao, who, however, were not in his line of succession. In their attempts[21] there was no linguistic enquiry through structural

analysis of the writing. But recently two studies appeared, which were more or less on lines similar to Fr. Heras'. The first of them was Russian. A preliminary report in Russian appeared in 1965. Its sequel—referred to in this paper—was published in September 1968.[22] It was, in fact, a cooperative effort. Knorozov dealt with the formal analysis of the written texts. Volcok interpreted the signs of the script and Gurov attempted the actual reading.

Nature of the Script

The script was described as pictographic,—the signs having been found more or less conventionalized.[23] Some signs were considered phonetic.[24] Significance of the signs was sought by comparing them not only with one another but also with animals and figures cut on the seals, with clay figurines and other objects excavated from the sites and even with descriptions in Indian mythology and also illustrations in Indian iconography.[25]

Nature of Language

An idea of the nature of the language was obtained by submitting the written records to structural analysis with the aid of a computer. By the way, this was the first instance of the use of computer for the purpose. The Indus inscriptions were turned into a continuous record, obliterating beginnings and ends.[26] A control experiment with a continuous record of 1500 symbols in a known script and language, *i.e.*, Egyptian was performed[27] for purposes of cross-checking. The frequencies of linguistic units made up of sign-groups in the Indus script were noted. An inscription consisted of a principal block (sign-group), mostly preceded and/or rarely succeeded by supplementary blocks[28] except in the so-called sacrificial inscriptions from Harappa where the order of supplementary blocks was reversed. A block had a main sign, which, apparently, was a root-morpheme and was followed by different variable signs that possibly were morphological formants or word-building suffixes. There were also semi-variables of two kinds, the first standing between the main sign and variables and performing the function of derivative suffixes. The second kind of semi-variables preceded the main sign and could have been syntactical formants.[29] The Russians were able to distinguish

between suffixes having different grammatical functions, *i.e.*, gender [30] (mostly masculine) and case (attributive or oblique [31] and the dative).[32] At times the genitive sign was left out between the two signs which normally had it.[33] Of syntactical elements they picked out participles and attributes. The information disclosed by analysis led the Russians to the conclusion that a Dravidian type of language was involved.

Copenhagen Group's Attempt

The latest attempt was by a group of Finnish scholars,—Asko Parpola, Simo Parpola, Seppo Koskenniemi and Pentti Aalto—working at the Scandinavian Institute of Asian Studies, Copenhagen. Their first announcement appeared in Feb. 1969, followed by another in April 1969.

Nature of Script

They first thought that the pictographic symbols, stood for full words and they, hence, called the script logographic.[34] Subsequently they modified their view. Since some signs, specially in compounds, apparently stood only for syllables, the script, according to them, should actually be known as logo-syllabic.[35] To arrive at the significance of the signs they consulted archaic Sumerian, Egyptian, Hittite and Chinese sign-lists, besides comparing the signs with one another and with the excavated remains.[36]

Nature of Language

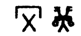
To obtain a knowledge of the language they did exactly what the Russians had done, though they had not known of the Russian attempt when they began their own. They too performed a control experiment with Sumerian, Elamite, Egyptian, Neo-Assyrian and Linear B to cross-check the results obtained by submitting the Harappan inscriptions to statistical analysis with the aid of a computer. They worked out the initial, final and total frequencies of each sign in the whole collection of inscriptions. They estimated the occurrences of signs also by pairs.[37] The analysis showed that certain signs were frequently followed by certain others.[38] The former were apparently main signs, which were probably nouns,

and the latter—comparatively quite few and accompanying various main signs—must have had grammatical functions like those of gender, number and case. Two genders,—masculine and feminine, two numbers,—singular and plural,—and two cases—genitive and dative—were identified.[39] In pair-wise combinations the preceding signs often denoted attributes and the succeeding ones were nouns. Sometimes both the signs of a pair were nouns with the sign for the genitive missing between them. The Finns called it zero genitive.[40] All these characteristics noticed in the structure of the writing are special to Dravidian.[41] Hence, the Copenhagen scholars decided that the language, for which the script was used, must have been proto-Dravidian. Obviously none of the modern Dravidian languages existed in Harappan times.

Points of Difference

There are several points of difference between the three studies. Whereas Fr. Heras and the Finns have copied out the sign-groups and inscriptions as they had been cut on the seals, so that the reading went from right to left—normal practice generally adopted by scholars—the Russians did exactly the opposite so that the reading goes from left to right.

All of them do not agree on the total number of signs. Fr. Heras estimated about 360 [42] basic ones, the Russians 350 [43] and the Finns anywhere between 250 and 350.[44] The difference arises mainly because of variants. For the Finns there were more variants than for the others.

There is difference in the classification of the signs Perhaps the most elaborate classification was that of Fr. Heras.[45] The Russians hardly attempted any, apart from talking of composite signs and circumgraphs.[46] The Finns [47] considered all composite signs as ligatures *e.g.*,  whereas Fr. Heras brought under ligatures [48] only such signs as had a ligature or a line—not ment to be read—which tied up two otherwise independent signs *e.g.* .

Originally all the decipherers agreed on the nature of the script, namely, that each sign stood for a whole word. The Finns however, subsequently came to consider the script partly syllabic as apparently some signs had stood for parts of words. But their,

argument does not seem very convincing. They gave two examples.[49] The first read by them as *Koil*=temple, was compounded of =*Ko*=god and =*ila*=red flower. In the combination the final syllable of *koila* was dropped for the result to become *koil.* There seems to be no compelling reason to omit the final vowel and sense could be made even with the word *koila.* In the second example which was read *Kottai*=fort, castle, palace, the new element X was said to signify *attai*=upper room, tower or *atai*, *atta*=across, crosswise. In the combination the initial syllable or vowel of *attai*, *atai* went. That was because of the requirements of the laws of fusion. Here was not a case of combination of a word (*Ko*) and a syllable (*ttai*) but of two words (*Ko* and *attai*).

A major point of difference lies in deciding what the symbols stood for. Fr. Heras *e.g.* took as a man with two extra hands and, therefore, a deity.[50] Among the Russians Knorozov suggested that the sign stood for a female person with sagging breasts and uplifted hands,[51] while the other two scholars[52] agreed with Fr. Heras. The Finns originally did the same[53] but subsequently felt that the uplifted hands were horns,—as if horns ever grew from shoulders or neck ! The sign, therefore, represented a horned person or an evil spirit.[54] Knorozov considered U as standing for aswatha tree[55] while Gurov,[56] Fr. Heras[57] and the Finns took it as the genitive suffix. For Fr. Heras was a flag[58] and for the Russians, who copied it a little differently *i.e.*, it became a stylised bird in flight.[59] Fr. Heras construed as four houses,[60] the Russians as case (dative)[61] suffix and the Finns as gender (feminine) suffix[62] was a scale to Fr. Heras,[63] a loadbearer or guard to the Russians[64] and the plural suffix[65] to the Finns.

The Russians consulted the figures and animals represented on the seals and figurines and other objects recovered from the excavations for an interpretation of the signs. But the aid they got was limited. So they had recourse to descriptions in later mythology and illustrations in later iconography—a dangerous process, as will be shown. Fr. Heras and the Finns went to foreign sign-lists for assistance. As more than one sign in those lists could be made to agree with a particular Indus sign, differences of interpretation arose. Fr. Heras[66] *e.g.*, compared the proto-Chinese sign or

for cloud with the Harappan sign whereas the Finns[67] found resemblance between it and the Egyptian sign for ear. Fr. Heras[68] connected the Indus sign with the Sumerian for eye, but the Finns[69] took the latter as similar to the Harappan sign . Consulting foreign sign-lists could be risky as the circumstances of the growth of foreign script, vis-a-vis the Harappan were not exactly similar, nor were the stages of their development the same.

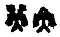
Instances of difference in fixing the significance of signs by different decipherers could be multiplied but that would go beyond the scope of this study. It may, however, be noted that the range of differences could have been cut down to an appreciable extent, had the signs been copied out alike. This at least is a field where unanimity could be achieved, if the Archaeological Survey of India brought out a new, upto-date, clearly transcribed sign-list.

If there is plenty of difference in the interpretation of symbols, there is much more in the actual reading. But first a word must be said about the direction of reading especially of compound signs. The Russians hardly gave definite proto-Dravidian readings of such signs. Fr. Heras had read all but published only a few. The Finns read some. Fr. Heras was generally consistent. When components were side by side he read them correctly from right to left; otherwise he read the main component before the subsidiary one. There were, however, exceptions. Whenever meaning *Ur*=city occurred, it was always read last irrespective of its position or importance in the compound. For example, was read *Kolur*[70] and *Velur*[71],—which were obviously names of cities. Then again in some cases where a sign was inserted into another, he read the insert before the main sign *e.g.* = *Munmale*=[72] three mountains and =*ruval*[73] = noisy happiness. Moreover, while in the case of signs with determinatives, he generally read the determinative after the sign, he reversed the order when the determinative of totality was involved, *e.g.* =*elal*=all men and = *elamunkal* = all munkals (a tribe).[74] The reason for these exceptions was not explained. If in these cases also lack of standardization with which he accounted for duplicate phonetic sign-groups[75] were to hold good, it would have led to unnecessary confusion.

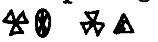
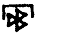
The Finns consistently read from top to bottom all compound signs where the components were arranged one on top of the other. They followed the Egyptian practice. It, however, landed them in trouble with regard to and their genitive and dative plurals respectively. Reading them from the top led to an arrangement of case suffix followed by plural suffix—absolutely undravidian in structure. So the Finns were forced to consider as an ideograph and give it a different meaning.[76] In the bargain their genitive and dative plurals vanished. All the bother could have been avoided, had they read the compound signs in a logical way by starting with the principal part. This seems particularly cogent when a sign has a determinative; surely the determined sign was the primary element and the determinative secondary.

Now coming to the actual reading, Fr. Heras read in proto-Dravidian several signs, sign-groups and inscriptions. Some of the readings are questionable. In his classification of signs he dealt with phonetic combinations and duplicate phonetic combinations. Their significance could be determined only from the actual reading. For example, in the following phonetic combination =*Iralar*; a tribe, =*ir*=to be, joined with =*alar*=flower, to produce a word with quite a new meaning.[77] The word *Iralar* could be written as well as —a case of duplicate phonetic combinations.[78] by the way, the combination was apparently one way of indicating plural and should have been read merely *alar*. Anyway, all these combinations—and even different modes of pluralisation—must have led to certain amount of confusion. Fr. Heras offered the explanation of lack of standardisation of script, which was in a stage of transition.[79] One of the most striking features of the Harappan civilisation was a high degree of standardisation imposed obviously by a powerful central authority. No doubt, there were deviations—even in the most authoritarian state individuality cannot be completely suppressed. Writing, however, is too serious a matter to have been left to individual fancy. The cases under discussion look like the result of inventiveness, refinement and development; if so, the script too would have developed apace and new signs and modes of writing would have been invented to avoid possible confusion. On the contrary during its entire floruit in the script did not show any conspicuous change. It does not, therefore, seem likely that such sophistications as

phonetic combinations and duplicate phonetic combinations could have been in vogue in Harappa.

The Russians and the Finns gave the proto-Dravidian readings of only a few signs and sign-groups. This makes it difficult to judge if a particular reading is correct, since one does not see its connection with the whole context of the relevant inscription. In a number of cases the Russians made matters even more difficult. They merely showed a number of possible interpretations to choose from. All of them might not fit into the content and even if they did, it was up to the decipherer to indicate them most appropriate choice. Volcok, *e.g.*, read shining goddess and interpreted the diagramm as standing for Prabhat,[80] the sun's spouse or Durga,[81] whereas Gurov suggested Saraswati.[82] Gurov pointed out that the sign might mean four or good or might even be prefixed to a person's name in the latter sense without any real structural significance at all.[83] He further indicated[84] that and its variants  meaning load-bearer or guard could be interpreted as standing for god-protector in some cases, in others for the mere act of protection and in yet others for a weight, especially when preceded by a numeral sign.

A few of the interpretations suggested by the Finns do not seem quite sound. For example, in the following inscription,[85] there appears to be some internal inconsistency. Ins. No. 2069. The last four signs were said to refer to the temple of the red star (Siva). The rest of the inscription, it was pointed out must have denoted royal titles. One of the signs,—constituting the titles,— was interpreted as the potter's wheel and subsequently made to signify the discus weapon of Vishnu-Krishna. One fails to see how Vishnu's discus could be connected with Siva.

The Finns too—not exactly like Fr. Heras in his duplicate phonetic combinations—discovered instances of more than one way of depicting an idea. For example, all the four sign-groups   were supposed to mean King's house.[86] In the first two cases the meaning was obviously derivative, the notion of King having been derived from royal emblems. In any case these different ways of writing down the same thing must have

caused confusion in reading except to those specially initiated into the intricacies of recognising instances, where the derivative significance had to be preferred to the primary.

Only a few signs were read alike in the three studies. To this category belonged *e.g.*, the fish and homo-signs, the sign for the genitive or oblique case and those for some of the numerals. But as said earlier, meanings given to the vast majority of signs and sign-groups varied widely. In the present context this is bound to happen. At the moment the decipherment of the Harappa script is mainly a matter of choice between alternative readings.[87] Because of the existence of several meanings to words and that of homonyms or homophones, the alternatives are many and the choice wide.

There is a definite danger here. Advances have doubtless been made towards the re-construction of proto-Dravidian due to researches conducted on a global basis in the U.S.A., U.S.S.R., Czechoslovakia, U.K., Holland and India. While work on a comparative basis has achieved commendable progress, that on a historical basis is lagging far behind. Compilation of a historical dictionary could be pushed back to the time of the earliest Tamil-Brahmi inscriptions, *i.e.*, 3rd. cen. B.C. From that date backwards upto the end of Harappa there were hardly any written records except symbols on punch-marked coins and graffiti on megalithic and chalcolithic pottery. These signs, though obviously related to Harappan ones, were too few to be made to speak intelligibly. Many homophones could have come into vogue during this almost script-barren period. Due, therefore, not only to the lack of adequate work on a historical basis going back to the Asokan age but also to the impossibility of working out anything at all, because of lack of records, for about a millennium and a half preceding Asokan times, there is no knowing when many homophones began their existence.

And yet, according to scholars,[88] working back on a comparative basis, from the modern Dravidian languages, through their pre-stages, to south proto-Dravidian, central proto-Dravidian and north proto-Dravidian and from them back again, one could arrive through a process of dead reckoning at the 3rd millennium B.C., as the date for the parent proto-Dravidian—the same date as for

Harappa. If so,—and it is a big 'if'—the comparative study could help towards the reconstruction of proto-Dravidian phonology, morphology, grammar and vocabulary in a most rudimentary form. There are, however, limitations to this method of reconstruction. There is not enough material on some of these languages —the uncultivated or non-literary ones—due to lack of adequate field-work. Moreover, in regard to these languages,—and they are the majority,—the spoken usages are taken into account for reconstruction work, whereas in the case of the literary ones the written forms often far different from the spoken idiom,[88] are considered. But even in the epigraphical records of the literary languages the written idiom was not always used. One cannot be sure what idiom the Harappan seals carried. Perhaps the idiom varies according to the purpose of the seals. Those that spelled out ownership and others votive in character possibly had the spoken style and those meant to be educational aids contained the literary norm. Then again, it is not impossible that certain proto-Dravidian forms and words have vanished altogether. It might, hence even be, that for some Harappan, signs no, values could be given. Anyway, the decipherers might not take undue risk, if they confined their attention only to the reconstructed proto-Dravidian roots, directly referring to the Harappan signs, and were chary about the choice of derivatives and homophones, which have apparently, played plenty of havoc. We shall then see some unanimity in the reading, though we shall not be sure about its correctness.

Points of Agreement

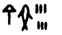
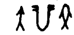
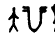
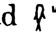
On two major points, Fr. Heras, the Russians and the Copenhagen scholars agree. The first, of course, concerns the line of approach to the question of determination of language. They all submitted the entire Harappan written output to statistical analysis. There was, no doubt, difference in detail. The Russians and the Finns apparently had before them the great achievements of the science of cryptology, which had been highly developed during World War II by the intelligence agencies of the warring nations. Secret codes were then successfully cracked by structural analysis. The first time that this technique was applied to an unknown ancient script was when Michael Ventris[89] deciphered in 1953 the Linear B Writing of Crete. But Fr. Heras had hit upon the idea

as early as the late thirties. He did not live to publish, as he had intended,—the complete Key to his decipherment but he had given in some of his articles and his volume on Proto-Indo-Mediterranean Culture enough hints of his methodolgy.

His work, however, suffered from certain unavoidable handicaps. His analysis cannot be expected to have been so thorough and exact as that of the Russians and the Finns, who made full use of the latest mechanical aids. He had to do all his work manually—an amazing performance, if one takes into account the vast amount of statistical effort involved. He could not crosscheck the validity of his method by applying it to a known script and language, as his successors did. Yet another handicap that faced him was the fact that reconstruction of proto-Dravidian was in its infancy in his day. Thus, he had the assistance of the foremost Dravidian linguisticians. But norms for proto-Dravidian reconstruction were not so firmly fixed then as now. Likelihood, hence, of wrong reconstructions cannot be ruled out. For example *Kadavul*=god [90] and *Kalude*=ass [91] are too multi-syllabled to have been proto-Dravidian. The proto-Dravidian words for six and goat or ram were *caru* and *yadu* [91a] respectively and not *ar* and *edu* [91b], as Fr. Heras reconstructed. And yet, he blazed a trail which others have followed consciously or unconsciously. His work appeared at a time when not many were prepared to accept an unorthodox view. He however, was a true pioneer.

The second major point on which the three attempts at decipherment agree is that they have all tried to trace many ritual-practices in modern Indian religion back to Harappan times Fr. Heras read a number of later-day beliefs, customs and observances into the Harappan inscriptions. The Russians and Finns did the same into the signs and sign-groups they had tackled. The Russians, in fact, focussed their attention solely on the so-called sacrificial inscriptions, which they have said [92] after Vats the excavator came from Harappan layers VI–V and were the earliest known to date,—a rather tall claim in view of the lack of scientific stratigraphy in early Indus valley excavations. The Finns, in their first announcement, hardly elaborated on religion, though they had suggested certain sign-groups stood possibly for names of deities[93] and also surmised the origin of the caste-system[94]

by choosing for sign a homophone, meaning ritual purity and dating definitely after the Sangam age. In their second announcement, however, with their rigorous regard for the rebus principle, and their hurried hunt for homophones they went all out to expatiate on Harappa's rich religious structure.

Fr. Heras saw in the sign-combinations and the three eyes of proto-Siva [95] and Minakshi [96] respectively. He found a reference to the auspiciousness of seeing the Pleiades [97] in an inscription containing the sign-group  . The Russians discovered elaborate sacrificial rites and invocations to deities and identified Prabha, Durga, Saraswati, Lakshmi,[98], Yama,[99] Garuda,[100] Skanda and guardians[101] of places and direction. They even picked out the different names of Skanda, *e.g.* =spear-god[102]  =the beloved of the six stars,[103]  . =He of the red star, Planet Mars, Skanda.[104] The Finns dwell on the ritual nature of the Harappan public and private baths [105] and tried to prove they were meant to cleanse the bathers of the evil influence of demoniacal astral bodies [106] like planets and stars in the form of Siva, Durga, Skanda and Vishnu-Krishna ! The Finns distinguished between different designations of Siva *e.g.* =red =Siva,[107] and  =red star=Siva.[108] Durga,[109] Siva's female counterpart, was which was the feminine of . Skanda was represented by =Siva stars[110] and Vishnu-Krishna by =*mai-min*=dark star.[111] All these readings and interpretations, are, no doubt, extremely ingenious. They are, however, the outcome of theological and astrological speculation of which there is hardly any evidence in Harappa.

One gets the feeling that the process of reading certain signs was rather laboured. The meaning of a sign, it is true, can be fixed with greater precision by connecting it with the context than otherwise. But the danger here is that one may read a meaning chosen to suit a context that has already been reconstructed from a particular angle. Fr. Heras, for example, appears to have read the sign *Velur* instead of *Urvel*—as he should have in accordance with the normal way he had adopted with regard to signs composed one on top of another—merely to fit it into a context that could be construed to contain reference, to a later puranic story about the founding of the city of Velur[112]. The Russians arrived through

some elaborate and involved semantics at the meaning of " make-give" for the sign apparently signifying a fish-hook, just because it had been found in an inscription with the goddess sign and the cup sign interpreted as denoting offering[113]. The Finns originally regarded this sign as standing for deity. Subsequently, however, they discovered horned beings in Indus iconography like the buffalo-horned proto-Siva—other scholars have considered the head-gear an ornate trident. They took into account the disparaging Vedic remarks regarding Dasyu deities—as if the Aryans would have talked differently of their opponents. They noticed the sign associated with others, which stood for apparently astral bodies. So they decided that the Indus people worshipped astral beings that were evil—such worship has been referred to in later literature. Hence, they decided the sign stood for a horned being and looking for words that would contain the significance of astral being and evil spirit, read the sign as *cokku*,[114] denoting a demon, which has a homophone, *cukku*, signifying star,—a gigantic manœuvre in making the meaning of a sign fit into and already prepared context.

At the back of the minds of the decipherers was the notion that Indian religious tradition and ritual had been remarkably stable through the ages,[115]—a concept open to doubt. What is open to even greater doubt is the assumption that because of this alleged stability, religious ideas that were prevalent at a later date must have existed even in an earlier age, where, in fact they were not attested. No doubt religion is the most conservative element in a culture but that is no justification for a grand exercise in concept-transplantation, through semantic interpretation, in utter disregard not only of the chronological gap but also of the nature of the milieu involved. Written evidence for Indian religious ritual whether in Sanscrit or Dravidian is very much post-Harappan, in fact, hardly pre-Mauryan. As regards the earlier oral tradition none can tell when particular practices and beliefs began. And to effect a throw-back of such material into the Harappan scene can only be a dangerous leap in the dark. Moreover, if anything specially strikes one with regard to Harappa civilisation, it is the lack of evidence for a priest-ridden, religion-dominated society. To date no structure, even remotely resembling a temple, has been identified, at any Harappan site. Some, specially MacKay, sug-

gested that the great bath, the collegiate building and even the granary of the Mohenjo-Daro citadel mound were parts, on the Sumerian analogy, of a temple-complex—*quod est demonstrandum.*

It is not suggested here that the Harappans knew no religion. They certainly had the proto-type of Siva, the mother-goddess, symbols like pipal and possibly phallus and obviously sacrifices. But one should be chary to attribute to them an unwarranted expansion of ritual. Harappa civilisation, essentially commercial, mainly maritime, apparently had little time or inclination for the luxury. This contention will be patent from a comparison between on the one hand the Sumerian and Egyptian and on the other the Harappan civilisations. Remains recalling the grand tower—temples of Sumer and the imposing Egyptian houses of god, the prolific pantheons of both and the elaborate burial ritual *e.g.*, in the royal cementary of Ur. and the awe-inspiring pyramids of Egypt are conspicuous by their absence at any Harappan site.

It is again not suggested here that Harappan religion knew no change in Harappan times. The paradox of permanence of change applied than as it always does and Harappan religion like everything else came within its ambit. But in view of stratigraphical insufficiency in the early Indus excavations it is difficult to evaluate the nature of the change in Harappan religion. And yet, given the Harappan way of life—and temperament—it does not seem likely that there would have been any appreciable religious transformation. At least there is no evidence of there having been any agency to bring it about.

All the three decipherment studies seem significantly to point to the evolution of ideas in the individual mind and could thus show the way to what might have actually come about, in days gone by, in the larger context of culture. Simple, straight-forward notions became elaborate and intricate and even got specialised. For Fr. Heras, for instance, the digramma standing for three eyes became an appellation of proto-Siva. The expression fish-eye denoted permanent and clear vision and in the end came to be associated with Minakshi, the successor of proto-Siva's consort. For the Russians a spear-man became a spear-god and got specialised as Skanda. A flying bird, having acquired sacredness, changed to Garuda. A load-bearer-turned-guard was transformed

into a guardian deity. A shining goddess emerged as Saraswati. For the Finns six stars became the Pleiades and finally Skanda. The black star got turned into Saturn, the black planet, and ultimately Vishnu, the black god.

In pre-historic, rather proto-historic, times the largely secular ideas and simple religious notions of the Harappans were transformed into a manifold mythological and ritualistic system. On the seemingly slender Harappan base was raised a stupendous super-structure. The gigantic monument, however, was not Harappan but alien-inspired. It was the proud product of the post-Harappan Aryo-Dravidian synthesis, achieved during the so-called Dark Age—with its political confusion, cultural degeneration and foreign domination—that after Harappa's collapse provided an environment admirably suited to the ascendancy of an opportunist priesthood, that elaborated an amazingly complex sacrificial rite, which was absolutely supreme and to which even the gods were inferior ! The pity was that the Harappan concepts, though religiously unpretentious and even non-oriented, lent themselves to an almost unrecognisable transformation. They apparently became the seed out of which was made to grow the multi-branched tree of a later day. But to suggest that the tree had attained sizable stature already in the heyday of Harappa is to overshoot the mark by not merely asserting without sufficient reason but specially ignoring all evidence to the contrary. The mainly secular, material grandeur of Harappa is likely to remain mute about a mighty-religion, unless scholars make its inscribed seals talk more than they can actually do.

Resume

Now that the nature of the language of the Harappa script has been fixed beyond doubt,—it cannot be a mere coincidence that everytime statistical analysis was applied to the written records it led to the same conclusion,— it is time for an international panel of decipherers, assisted by linguisticians and archaeologists, to meet and decide on the most suitable readings of the inscriptions. The signs need to be correctly copied out and their pictography and phonography cautiously interpreted with the aid of the archaic sign-lists of contemporary scripts. There should be strict adherence

to proto-Dravidian roots corresponding with the original significance of the signs, Semantic flights ought to be eschewed. Interpretations not warranted by the material remains of the culture must be discarded. It is not pretended here that the readings will remain final even for a while, but they will at least provide an agreed, though, perhaps, not unassailable, basis for further elucidation, whenever additional data or new insights become available.

REFERENCES

1 For a brief review of the early attempts cf. *S.P.*, pp. 29-61.

2 *Id.*, pp. 76-77 251-278.

3 *Id.*, p. 78.

4 *Id.*, pp. 77-78.

5 *Id.*, p. 79.

6 *Id.*, pp. 248-249.

7 *Id.*, pp. 65-66.

8 Cf. *P.D.*, p. 40.

9 *Id.*

10 Confirmation seems available from c. 14 date of 1760 B.C. given by a sample from the top-layer of Mohenjo-daro—apparently of the post-Harappan Cemetery H. culture. Harappa-culture, hence, should have ended c. 1900 B.C. Samples from Lothal and Kalibangan too seem to point the same way. While one from a late level of Harappan Lothal A—*i.e.* Phase IV A gave c. 14 date of 1900 B.C. two from post-Harappan Lothal B.—*i.e.* Phase V A gave 1860 and 1810 B.C. The latter sample was recovered from the debris of the dockyard that had already gone out of use. Two samples from late level of Kalibangan gave 2095 and 2045 B.C. (cf. P.E. *A.I.*, pp. 212-214).

11 cf. *infra* p.

12 This was the burden of Fr. Heras' *magnum opus.* He had planned more studies of this type on ancient west-Asian and Mediterranean cultures.

13 *S.P.*, pp. 66-67.

14 *Id.*, pp. 150-154.

15 *Id.*, pp. 149-150.

16 *Id.*, p. 150.

17 *Id.*, pp. 104-105.

18 *Id.*, p. 154.

19 *Id.*, p. 105.

20 *Id.*, pp. 64-65.

21 See *The Hindustan Times Weekly Magazine*, Sunday, March 30, 1969.

22 *P.I.*

[23] *Id.* p. 19.

[24] e.g. *Id.*, p. 35.

[25] *Id.*, pp. 19-20.

[26] *Id.*, p. 9.

[27] *Id.*

[28] *Id.*, pp. 10, 16.

[29] *Id.* p. 12.

[30] *Id.*, pp. 32–33.

[31] *Id.*, p. 33.

[32] *Id.*, p. 37.

[33] *Id.*, pp. 41–42.

[34] *F.A.*, p. 8.

[35] *P.D.*, p. 4.

[36] *F. A.*, p. 10

[36] *Id.*, p. 49.

[38] *Id.*, pp. 18–21 and 11–12.

[39] *Id.*, pp. 21–23, 27–30.

[40] *P.D.*, p. 21 ; *F.A.*, p. 21.

[41] *Id.*, pp. 41–42.

[42] For classification cf. *S.P.*, pp. 72–80. There were 241 pictographic and 125 phonetic signs.

[43] *P.I.*. p. 13.

[44] *F.A.*, p. 9.

[45] *S.P.*, pp. 72–96.

[46] *P.I.*, pp. 10–11.

[47] *F.A.*, p. 8.

[48] *S.P.*, p. 82.

[49] *P.D.*, p. 15.

[50] *S.P.*, p. 68.

[51] *P.I.*, p. 15.

[52] e.g. *Id.*, pp. 22, 43.

[53] *P.D.*, p. 11.

[54] *P.D.*, pp. 11–12.

[55] *P.I.*, p. 15.

[56] *Id.*, p. 33.

[57] *S.P.*, pp. 66–67.

[58] *Id.*, p. 78.

[59] *P.I.*, p. 15.

[60] *S.P.*, p. 74.

[61] *P.I.*, p. 37. Incidentally the Russians failed to explain the duplication of the dative sign (cf. *Id.*, p. 12), an undravidian construction. They have also not explained the sign-group .... (cf. *Id.*), where the dative suffix followed the genitive,—another undravidian construction. In this combination either of the signs must have had a significance other than case.

[62] *F.A.*, p. 29. In proto-Dravidian there were apparently two genders, one personal (masculine) and the other non-personal (other than masculine). There was no specific feminine gender (cf. *P.S.D.*, p. 3).

[63] *S.P.*, p. 87.

[64] *P.I.*, p. 15.

[65] *F.A.*, p. 23.

[66] *S.P.*, p. 79.

[67] *P.D.*, p. 16.

[68] *S.P.*, p. 101.

[69] *P.D.*, p. 28.

[70] *S.P.*, p. 83.

[71] *Id.*

[72] *Id.*, p 82.

[73] *Id.*

[74] *Id.*, p. 86.

[75] *Id.*, pp. 90, 91.

[76] *P.D.*, pp. 7–8.

[77] " S.M.", *R.A.*, p. 72.

[78] *Id.*

[79] *S.P.*, pp. 90, 91.

[80] *P.I.*, p. 22.

[81] *Id.*, p. 23.

[82] *Id.*, p. 42.

[83] *Id.*, p. 34–35.

[84] *Id.*, pp. 38–40.

[85] *P.D.*, pp. 20–21.

[86] *Id.*, p. 22.

[87] *D.L.*, p. 156.

[88] "C.S.", *A.O.*, pp. 375–376.

[88]a cf. *P.S.D.*, pp. 16–18.

[89] cf. John Chadwick, *The Decipherment of Linear B*, Revised ed., Cambridge, 1960.

[90] *S.P.*, p. 68.

[91] *Id.*, p. 69.

[91]a *P.S.D.*, pp. 2–3.

[91]b *S.P.*, pp. 127.

[92] *P.I.*, p. 1.

[93] *F.A.*, pp. 40–42.

[94] *Id.*, p. 39.

[95] " R.M.", *J.U.B.*, p. 9.

[96] *Id.*, p. 11.

[97] *S.P.*, p. 127.

[98] *P.I.*, p. 42.

[99] *Id.*, p. 21.

[100] *Id.*, pp. 24, 43–44.

[101] cf. note 84.

[102] *P.I.*, p. 23.

[103] *Id.*, p. 34.

[104] *Id.*, p. 42.

[105] *P.D.*, pp. 8–9.

[106] *Id.*, pp. 11–15.

[107] *Id.*, p. 16. As the proto-Dravidian word for ear was apparently *Kevi* (cf. *P.S.D.*, p. 21) the homophone meaning red must have been *Keva* or *Kiva*.

[108] cf. note 85.

[109] *P.D.*, p. 16.

[110] *Id.*, pp. 24–25.

[111] *Id.*, pp. 19–20.

[112] *S.P.*, p. 114.

[113] *P.I.*, pp. 45–47.

[114] cf. note 106.

[115] *P.I.*, p. 30.

[116] Fr. Heras read several proto-Dravidian words, as in modern Dravidian, with terminations e.g. *maram*, *kadavul*, etc. Even the Finns, in spite of the norms for proto Dravidian reconstruction did the same. Only the Russians rightly advocated the choice of root-morphemes. They, however, indicated these morphemes for very few signs.

ABBREVIATIONS

"C.S.", A.O. .. Kamil Zvelebil, "Comparative Study of the Dravidian Languages", *Archiv Orientalni*, Vol. 32, No. 3, 1965.

D.L. .. M. B. Emeneau, *Dravidian Linguistics, Ethnology and Folklore—Collected Papers*, Annamalainagar, 1967.

F.A. .. Asko Parpola, Seppo Koskenniemi, Simo Parpola and Pentti Aalto, *Decipherment of the Proto-Indian Inscriptions of the Indus Civilisation. A First Announcement*, Copenhagen, 1969.

P.D. .. Asko Parpola, Seppo Koskenniemi, Simo Parpola and Pentti Aalto, *Progress in the Decipherment of the Proto-Dravidian Indus Script*, Copenhagen, 1969.

"P.E.", *A.I.* .. B. B. Lal, "A Picture Emerges—an Assessment of the Carbon-14 Datings of the Proto-historic Cultures of the Indo-Pakistan Subcontinent", *Ancient India*, Nos. 18 and 19. New Delhi, 1962 and 1963.

P.I. .. *Proto-Indica: 1968. Brief Report on the Investigation of the Proto-Indian Texts*, Moscow, 1968.

P.S.D. .. Kamil Zvelebil, *From Proto-South Dravidian to Old Tamil and Malayalam*, II International Conference of Tamil Studies, Madras, 1968.

"R.M.", *J.U.B.* .. H. Heras, "The Religion of the Mohenjo Daro People According to the Inscriptions", *Journal of the University of Bombay*, 5, pt. II, 1936.

"S.M.", *R.A.* .. H. Heras, "La Scrittura di Mohenjo Daro", *Rivista Asiatica*, Anno III, Fasc. II, Roma, 1937.

S.P. .. H. Heras, *Studies in Proto-Indo-Mediterranean Culture*, Vol. 1, Bombay, 1953.

The Indus Script Deciphered?

GERARD CLAUSON and JOHN CHADWICK

The Scandinavian Institute of Asian Studies was founded as recently as 1967 with a governing body of distinguished scholars appointed by the four contributing countries. With this, its first publication, it has got off to a flying start.

Ever since the first specimens of the Indus script were published nearly 40 years ago, it has constituted a standing challenge to scholars with a bent for cryptography. Several attempts have been made to decipher it, but as Sir Mortimer Wheeler remarked, before the publication of this monograph, in *The Indus Civilization* (3rd edition, Cambridge, 1968, p. 107, footnote 2,) 'the published attempts to do so are invalid'. This judgement is now due for drastic reconsideration.

Until the team which produced this monograph started work, all that could confidently be said about the background of this semi-pictographic script was that the earliest specimens of it can be dated to about the middle of the 3rd millennium B.C., which means that it was invented not later than about 2500 B.C. ; that it fell out of use in about 1800 B.C., having undergone only minor changes ; and that it cannot be connected with the Sumerian or any other script which has so far been deciphered, though it is obviously of the same character as other early scripts.

The plan to apply modern methods of decipherment to the script arose out of a conversation between Asko Parpola, a young Finnish Indologist specializing in Vedic philology, and a Fellow of the Institute, and Seppo Koskenniemi, a young scientist, specializing in computers, and Scientific Adviser to International Business Machines, Finland.. It became a reality when I.B.M. offered to provide the necessary computer time free of charge. This was later supplemented by a similar gift from the Northern Europe University Computer Centre. The two then enlisted the help of Asko's younger brother, Simo Parpola, an Assyriologist, whose share in it was later interrupted by his call-up for military

service, and secured the patronage and help of Pentti Aalto, the doyen of Finnish philologists. The team was obviously a very strong one with representatives of all the disciplines likely to make a useful contribution.

The monograph is, as it is described, merely a first announcement, and a detailed review of the whole material, but it gives an adequate summary of the methods used and the conclusions reached, and shows with admirable clarity what a computer can do, and what it cannot do, in an undertaking of this kind.

Preparing the material for ingestion by the computer was a fairly laborious business. The first step was to make an accurate corpus of all accessible inscriptions in the script. The existence of some 2,000 inscriptions has been announced, but the team were able to establish reliable texts of only 1,944, comprising 9,147 signs. In length they varied from one to around 20 signs, with an overall average of nearly five.

The next step was to make a list of the 300 or so different signs used. This was obviously not easy since, when a script has been used in several places over a period of some hundreds of years, differences are bound to emerge and the question inevitably arises, 'how difficult is "different"?' Apart from the numerals, which are a special case, the team distinguished between (1) simple, more or less conventionalized, pictograms; (2) pictograms with one of two attachments, described as 'diacritical marks', which can be shown to be reduced forms of two signs, which in their complete forms are used as case suffixes; (3) signs which are ligatures of two pictograms. The team also found that some signs were used as 'determinative' in the sense in which that term is used in relation to cuneiform and hieroglyphics; some of these signs were also used in ligatures. The question whether some such signs were used both as determinatives, that is without any phonetic value and also as substantive words, seems still to be open.

The next step was to convert the material into a form suitable for ingestion by the computer. This involved first turning the table of signs into a table of three-digit numerals and then 'translating' the whole corpus of material into the appropriate numerals.

This was then put on to a series of punched cards which were fed into the computer. The computer, in effect, converted it into one long continuous line, each individual inscription being preceded by a code number.

From this the computer could be instructed to supply several categories of factual information and in particular :

1. The number of occurrences of each sign in the list.

2. Within that total the number of times on which it occurred as the first or last sign of an inscription.

3. A complete list of the 'pairs' in which any given sign occurred, as either the first or second member, the total number of occurrences of each pair, and within that total the number of occurrences at the beginning or end of an inscription. A specimen of a table of this kind will be found on p. 64 of the monograph.

4. A table of the complete texts of all the inscriptions in which any given character occurs, centred on that character. A specimen of such a table will be found on p. 68 ; it will be seen that each line is a cutting of 57 digits from the 'long line' referred to above.

Thus the computer could be instructed to perform with complete accuracy, and in a matter of hours, a number of complicated tasks which would have occupied the team for perhaps as many months. But that was the limit of its capacity ; having no brain it was quite incapable of interpreting any of the material which it supplied.

With the identification of the genitive, dative and plural signs, and the compilation of a number of case histories of other signs, the team reached the position of being able to divide the inscriptions up into individual words and to formulate theories regarding the nature of the various classes of inscriptions. For example it seemed reasonable to assume that a seal inscription ending in a genitive suffix contained the name and description of the owner. In formulating these theories they found useful analogies in such things as the inscriptions on Sumerian and Babylonian seals.

The stage was now set for the next phase of the exercise, an attempt to fix the phonetic values of as many signs as possible. For this purpose a hypothesis was required, and the hypothesis chosen was that the language was probably Proto-Dravidian. There are several reasons for choosing this hypothesis, which is of course not a new one. They are set out at the beginning of the monograph. One is the geographical one. It is difficult to explain the continued existence of a Dravidian language, Brahui, in Baluchistan west of the Indus valley far removed from the other Dravidian languages in central and southern India except by the assumption that the Dravidians entered the sub-continent from the west and that the Brahui got lost on the way. If this is so then the Dravidian invasion must have preceded the Aryan invasion and the Indus valley civilization, which came to an end shortly before the Aryan invasion, must surely mark another stage on their journey. Another argument was that *Me-luh-ha*, or *Me-lah-ha*, the Sumerian name for 'India', that is the Indus valley, is almost certainly identical with the Aryan word for 'a non-Aryan Indian', Pali *milakkha* and the like, late Vedic *mleccha*.

Obviously no script could have survived indefinitely as a simple mixture of pictures and puns; its scope would have been far too restricted and it would have had in course of time to evolve into a syllabic script. But the case which the team has made out for regarding this script as a mixture of pictures and Dravidian puns seems to be overwhelming, as the following two examples will show:

(*a*) (pp. 30, 37, 64, no. 8) a signs which is fairly common and occurs in several forms and ligatures is almost certainly a picture of a drum, and as one of the words for professions almost certainly means 'priest'. In Dravidian 'drum' is *tampa*(*ḷa*); *tampa* (*ṭa*) means 'priest'. In this case 'drum' may be used as a symbol rather than as a pun.

(*b*) (pp. 40 ff.) there is a group of signs of which the basic form is a picture of a fish. There are good reasons for supposing that they are the names of deities. 'Fish' in Dravidian is *mīn*, which also means 'star'. The suggestion, which seems to be well-founded, is that the are seastral deities.

Obviously a great deal of work still remains, the origin of many signs is still obscure, and it is very unlikely that a convincing translation of the whole corpus will ever be produced. But its general character now seems clear.

It is pointed out (p. 31) that the 'drum' picture also occurs in the undeciphered Proto-Elamite pictographic script. As long ago as 1932 it was hotly debated whether the two scripts were related. 'That the languages are unconnected is probable, and the phonetic value of the signs may well be different. But that they are unrelated in origin seems to be contradicted by the number of resemblances, that seem to be too close to be explained by coincidence.' (G. R. Hunter in *Journal of the Royal Asiatic Society, 1932, 483.*)

That 'the languages are unconnected" is another old *obiter dictum* which is due for drastic reconsideration. In Chapter III 'The Elamite Language' of *Yazyki drevney peredney Azii*, Moscow, 1967, I. M. Dyakonov sets out the arguments in favour of the theory (it almost amounts to a certainty) that Elamite and Dravidian are genetically related. There has never been any plausible theory that either of them is genetically related to any other language.

The prospects for future useful research in this direction are fascinating, and it is very much to be hoped that the team, after their brilliant achievements in their chosen field, will now turn their attention to Proto-Elamite, one of the few remaining unsolved cryptographic problems of antiquity.

GERARD CLAUSON

One of the great archaeological discoveries of this century was the revelation of the early civilization of the Indus valley. A flourishing urban culture existed in this region between approximately 2500 and 1800 B.C.; yet Indian tradition knew nothing of it. The Vedic hymns may reflect in places the invasion of the Aryans into India, and they speak darkly of 'enemies'; but until the discovery of Harappa and Mohenjo Daro we had no idea of the advanced civilization the Aryans, replaced, if they did not destroy it, in N.W. India.

One of the many proofs of the level of civilization reached was the existence of a well-organized script. Signs which are clearly some kind of writing were found mostly on seals; but a few other uses were known, especially thin copper tablets bearing pictures of animals. The material was scanty, some 2,000-odd very short inscriptions, and despite the usual crop of amateurish nonsense, little real progress towards decipherment was made until early this year, when a group of Finnish scholars published a first announcement of their partial decipherment. If their claim proves to be justified, this is a brilliant technical achievement, but it must not be supposed that it will lead to any dramatic discoveries. It confirms the most likely guess about the people of the Indus civilization, but so far there is no sort of literature in the script known, and even the inscriptions we have are very brief.

The authors of this remarkable publication are a group of three young scholars: one is a Vedic expert, one an Assyriologist, and one a statistician; and they have been joined by an older man, Pentti Aalto, who is professor of comparative philology in the University of Helsinki. They are to be congratulated on their careful, methodical approach, and their use of statistics: a computer was perhaps not necessary, but certainly lightened the labour of compiling the essential statistics. It is often claimed that computers can decipher scripts, and in certain conditions this might be possible; but I have never yet met such a problem where the counting could not have been done by hand, and the use of machinery could well lead to an important lead being overlooked.

The initial step in a decipherment is to discover the size and limits of the systems how many different signs are used, and what are their relative frequencies in various positions. This is simple enough in a printed alphabet, but presents grave difficulties if variant forms of the same sign are used. These may be either due to scribal differences of hand or the result of the use of diacritical marks and modifiers. In this case it is rather the second of these which is relevant: the script is very formal and neat, but there are numerous ligatures which are not always easy to resolve.

The number of different signs comes out, according to how the count is made, at between 250 and 350, of which only 103 appear

10 times or more. This figure is low if the script is purely ideographic, that is to say, if each sign stands for a whole word ; but the limited and stereotyped material may account for the restriction. It could also represent a complicated syllabic system, of the type known in cuneiform. But another possibility which would perhaps suit the distribution of frequencies better is that it is a mixture of ideograms and phonetic elements, probably accompanied by determinatives, that is, signs with no spoken value but which serve to limit the semantic area to which the word belongs.

The direction of writing is clearly from right to left, except that in inscriptions with two lines the direction is reversed in the second line (on the *boustrophedon* principle of early Greek inscriptions. The signs are not marked off into groups, but groupings can be detected by their repetition ; if we had long continuous texts it would be fairly easy to distinguish these, but on such material as we have only limited progress is possible. Table 1 (based upon information on p. 11 of the booklet) shows how words can be distinguished and a suffix identified.

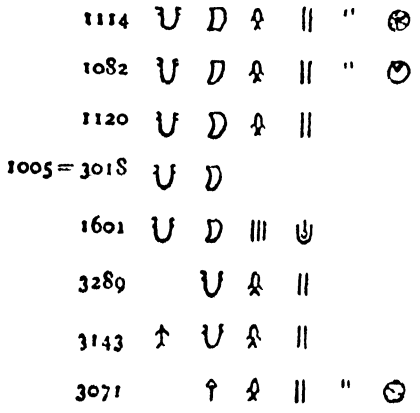


Table 1. Identification of words

The suffix which stands at the (left-hand) end of each of these examples except the last two proves to alternate with another, the 'arrow' sign at the end of 3071. The behaviour of this pair strongly suggests some sort of inflexion, but perhaps expressed by a suffix or post-position rather than a modification of the basic word. It seems logical to regard the more common as *genitive*, the less common 'arrow' sign as *dative*. They are both found

ligatured with another sign, which, following a suggestion of Professor Aalto, was identified as the *plural* marker. The results of this step are displayed in Table 2.

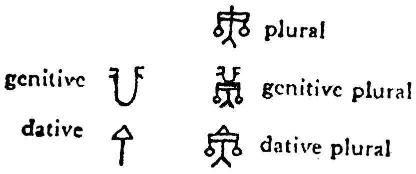


Table 2. The suffixes

So far the deductions are plausible if not actually inevitable; it is hard to see what else these signs could represent. The next stage is to identify another kind of suffix: two signs which usually alternate, though in one case they are combined. One, that to be seen at the end of 3143 in Table 1, is a crude figure of a man; it might therefore be an indication that the word to which it is attached describes a man. If so, the alternating sign is presumably woman. Table 3 displays these.

Table 3. Man and woman

The plural in this case is sometimes indicated by the repetition of the same sign. But whether this indicates an actual repetition of the word to indicate a plural, or whether these signs are determinative without any (necessary) phonetic value is not at this stage clear.

All these steps can be taken without forming any hypothesis about the exact nature of the script or the language. The next is a double leap, because it involves both a theory of the script and the identification of the language. If the first is correct, then I think the second must be; and the first is, though surprising to those unfamiliar with primitive scripts, wholly plausible.

The history of writing shows that most scripts which were not simply borrowed, but had to start from scratch, began as pictures. Common natural objects—a man, a horse, a table, a house, a cup, the sun, the moon and so on—could all be simply drawn, and a conventional element could be introduced to ensure that objects

which might have similar outlines would be distinguished (*e.g.* the moon will be shown as a crescent, since the full moon would look like the sun). But the limits of this system are very soon reached. There are many objects which are hard to draw, even conventionally, and abstract ideas pose special problems. Hence what usually happens at this stage is that two signs are combined, one of which indicates the semantic class to which the word belongs (the determinative element), while the other is the pictorial sign for an object with a name similar to that to be written. In the Chinese system most of the ideograms are compounds, consisting of a determinative classifier and a quasi-phonetic part, which gives a hint rather than an accurate representation of the sound. In other scripts the determinative may be kept separate and a succession of signs be used to indicate the sound of the word ; and of course the determinative may be omitted altogether.

The Finnish authors have concluded that the Indus script is not, as they at first thought, syllabic, but logographic ; that is, each sign represents a whole word or major element of a compound. But this does not exclude the likelihood of some signs, such as that for ' man ', being used simply as a determinative (*i.e.* not only as the second part of *business-man*, *fire-man*, etc., but also of *priest*, *clerk*, etc.). Now if the object the sign represents can be identified, we can predict that the word which describes this sign must have some phonetic resemblance to the word actually intended. For instance, the Indus script contains a sign which is unmistakably a scorpion ; it is unlikely that the limited material we have should often discuss scorpions ; it therefore follows that the sign for ' scorpion ' must be used to represent another word of similar sound.

A very faint echo of the determinative system survives in our use of a capital letter to indicate a proper name : *Brown* and *brown* are pronounced exactly alike, but the *B* conveys the information that it is here a name. In an ideographic script, if we have a sign for *brown*, we can use it also to write *Brown*. But this leads to another principle, that any sign can be used to represent not only the original value, but also any word pronounced alike, and even words which are not strictly homophones. To take an imaginary example, we might devise an ideographic sciipt where each word

was expressed by a pictorial symbol, but use these also for homophones. Thus it would be possible to write, using a pictorial symbol for each word : TWO BEE OAR KNOT TWO BEE to convey 'To be or not to be'. Now the point of this example is that it is specific for English. There may be other languages in which the words for *to* and *two* are homophones ; but it would be incredible if there were another in which all four of these words are homophones, unless of course they were very closely related.

If we now apply this principle to the 'man' and 'woman' signs, the 'man' sign offers no problem ; it is simply a picture of a man. But the 'woman' sign is not a picture of a woman ; it looks like a comb, and we know that ivory combs from India have been found as far away as, Mesopotamia. Is there then a language in which the word for 'comb' closely resembles that for 'woman'?

The answer is yes ; the Dravidian languages show this connexion. 'The present-day languages of India fall mainly into two linguistic families : the Indo-Aryan, represented by Hindi, which we know was brought to India by invaders after the collapse of the Indus civilization ; and the Dravidian, represented by Tamil and Telugu, now spoken mainly in the south and east of India. This family is quite unconnected with the other (though of course they have borrowed words from each other), and gives the impression of having been forced back by the Aryan invasion ; for there is a curious enclave of Dravidian speech, called Brahui, in Baluchistan (now part of Pakistan).

But if the Indus people spoke a Dravidian language, this would not be the same as any existing one. Languages do not survive intact over 4,000 years. But there are ancient texts in some languages, and a form of Tamil is known as old as the 2nd century A.D. By applying the methods of comparative philology it is possible to reconstruct a great deal of the common source from which the present languages spring. Unfortunately this study has only recently begun ; but we are fortunate in possessing a Dravidian etymological dictionary compiled by Professor T. Burrow of Oxford and Professor M. B. Emeneau of California. This is the indispensable foundation which the Finns have used in their work. By means of this book we can now reconstruct the proto-Dravidian

form of many common words, and some will be quoted here (indicated by a prefixed asterisk).

We must first observe that a Dravidian solution for the Indus script is histoiically plausible. Indeed, if it is not correct, then presumably the language of the Indus civilization has no modern descendants in India. The only other possible candidate would be the group of Munda languages, which for various reasons are much less likely. Contact between Aryan and Dravidians has certainly been going on far a very long time, for not only have most Dravidian languages acquired some Aryan vocabulary, but Dravidian words have been borrowed by the Aryan family, and some of these occur in the later parts of the Vedas, thus proving the antiquity of borrowing.

Now let us return to the 'woman' sign. The Dravidian for 'woman' may be restored as ***peṇṭi*; the word for 'comb' as ***peṇṭika*. Thus the sign for 'comb' would immediately suggest to the reader the word for 'woman'. The fact that **peṇṭika* might be a derivative of **peṇṭi* (the womanly thing *par excellence*) is irrelevant. The fact remains that Dravidian associates the words for these two concepts. One such pair might be an accident. If we can find other examples, they can hardly all be coincidences.

The sign of the genitive (see Table 2) is not so easy to identify, but the authors show that it can well be a development of a picture of a ship with a high prow and stern (rather like a Venetian gondola), which has become squashed up to make a convenient sign. They quote very convincing Sumerian parallels; if correct, the Dravidian for 'ship' is **ōṭa*; and there is a similar word **oṭai* meaning 'possession' and a suffix **-oṭu*/*-ōṭu* which was already in use in Old Tamil to indicate the possessive function. There is thus a perfectly good reason why this sort of meaning might be written as 'ship'.

The 'arrow' sign leads to **koṭi*, *kōṭu* 'point', and this has the same form as a verb meaning 'to give'; it is very likely the original of the common datival suffix *-ku*, already in use in Old Tamil. Here one might argue that an arrow, as indicating transfer to a new location, is an appropriate symbol for the dative. But it

remains true that in Dravidian the words for 'point' and 'give' are very similar.

The plural suffix also yields sense on the same principle. It seems to be a picture of a man carrying two loads by means of a pole across his shoulders. It would be difficult to draw a distinctive picture of a pole in isolation, so perhaps the authors are justified in choosing the word for 'bamboo pole' for this sign. It is **kaṛai*; and this leads to **kaṟṟai* 'collection, bundle' and the suffix *-kaḷ*, used to indicate the plural in many Dravidian languages. The confusion of *r* and *l* is common enough in Indian languages; but it seems on the whole a weaker link than the others. Evidence for an ancient suffix *-kaḷ* seems to be lacking and this is believed to be a conflation of two suffixes, *-k* and *-ḷu*.

All the same, this is a curious group of facts, if they are all coincidences. The weakest point is the identification of the picture; if the genitive sign is not really a ship, the coincidence of the word for 'ship' and the appropriate suffix is irrelevant. One can only say that these hypotheses can be attacked individually, but collectively they hang together and support one another.

The authors have of course gone on to look for other words which might be revealed by the same process. I have dwelt at length on the first four because they are the only ones in which the meaning of the sign can be deduced with fair certainty from the context. But it must be added that some at least of the other words they have found look extremely attractive.

Take for instance the scorpion, mentioned above. The Dravidian is **tēl*, a virtual homophone of **teḷ* 'knowledge,' learned person.' The context favours a description of a person, since it is ligatured with the sign for man. Another is the 'bow and arrow' sign, similarly ligatured, which gives **vil* 'bow', homophone of **vil* 'to sell, price, etc.' 'Merchant' would be plausible sense for this context.

When the authors proceed beyond these simple cases it is harder to follow them with confidence. For instance, they identify one sign as a 'drum', which is plausible but not compelling. This then leads them to a very similar Dravidian word meaning 'priest',

and they are able to show that this is a satisfactory meaning for the sign. Unfortunately the Dravidian dictionary shows that this word means not priest in general, but specifically 'inferior priest' and also 'younger brother'. The semantic extension from 'brother' to 'inferior priest' is easy and has obvious parallels; but the reverse is much more difficult, and it would therefore seem likely that 'younger brother' is the basic meaning. It is still not impossible (in semantics little is) for this to have developed first to 'inferior priest' and then to 'priest' in general, so that the sign could be found combined with another meaning 'chief'. But such examples are at least open to question. Further work may, however, make them more secure.

Before we can accept this decipherment as proved, two things are necessary. First we need assurance from the experts on Dravidian philology that the reconstructed forms are sound; the *Dravidian Etymological Dictionary* of Burrow and Emeneau assembles the evidence and establishes the general rules, but it does not actually make the reconstructions. This applies especially to the suffixes. Where reference to the books seems in some cases to throw doubt on the facts quoted; but this may well be due to the writer's ignorance.

Secondly, we need to be sure of the meanings to be assigned to the signs. We are still waiting for the publication of all the material in the Indus script in a convenient corpus, so that assertions about the material can be easily checked. If we can establish the values of even a few signs as completely certain, then it becomes easy to test whether these are consistent with the Dravidian theory. Here too, the meanings proposed for the suffixes are plausible, but on the limited evidence quoted not entirely certain. It would be interesting to see whether research in the dictionary might not produce a few plausible solutions for scripts known to be totally unrelated; if one can show that, let us say, Chinese ideograms will give suitable values in Dravidian, this will destroy our confidence in the solution.

But at the same time, we must not adopt a negative attitude. If we try, it is almost always possible to make out a case against a decipherment; the writer has had ample experience of this. To

preserve an open mind is incredibly difficult, because we are either mesmerized into swallowing camels or so prejudiced we cannot manage the odd gnat.

What we shall need is not more possible or even plausible interpretations of signs based upon this theory, but the clearest possible demonstration that these meanings, and only these meanings, are correct. Once this foundation is unshakeable, it will be safe to build upon it, but we must not be led into admiring a house of cards which, elegant as it seems, will collapse if one prop is withdrawn. The authors of this booklet have a lot to learn about the presentation of their case; but the case itself looks extremely promising and we shall await developments with keen interest.

JOHN CHADWICK

NOTES AND REFERENCES

Sir Gerard Clauson has kindly allowed us to print a comment on his own contribution to this discussion (Antiquity, 1969, 200-202) *which he received in a letter from Professor Igor Diakonov of the Institut Vostokovedeniya, Leningrad.*

Professor Diakonov wrote :

As to Elamite, I am afraid that what you say of my arguments in favour of a possible relationship with Dravidian ('it almost amounts to a certainty') is an over-statement. What I actually think is that Elamite and Proto-Dravidian *may* possibly be distantly related, but this is at present impossible to prove because we know too little of the Elamite vocabulary and phonology and decidedly not enough about the historical grammar of Dravidian. What I wrote was, *verbatim*, the following :

All these data lead to the conclusion that a kinship between Elamite and Dravidian remains unproved. However, it must be granted that a hypothesis of Elamite being a very early and rather distant branch of Proto-Dravidian, or of Elamite and Proto-Dravidian being both descended from another more ancient parent language, is a legitimate one. In any case, such a hypothesis deserves to be checked : it seems that at present there are not sufficient data to contradict it, and some facts may prove to testify in its support. Admittedly, most of the parallel phenomena are of a purely structural kind, while material correspondences stand in contrast to rather numerous dissimilarities. This entire problem should be taken up anew in more detail' (I. Diakonov, *Yazyki Drevney Peredney Azii.* Moscow, 1967, 112.)

To this I now may add that I do not think that the relationship between Elamite and Proto-Dravidian, if any, is of such a kind as to render any help in the decipherment of the Proto-Elamite script. Both scripts seem to me to have developed more or less independently. As to the problem of the decipherment of the Indus script, I can only say that I fully agree with Dr. Chadwick.

Dravidian and the Decipherment of the Indus Script

T. BURROW

The Indus script has been known for a little over 40 years, and it has so far resisted all attempts at decipherment. This is not surprising in view of the fact that the inscriptions are all very short, and that no long connected texts are preserved. It is also not known what language lies behind the writing: bilinguals are non-existent, and given the historical circumstances, not likely to be found.

In the period since the discovery of the inscriptions a number of attempts at decipherment has been made, but none has carried conviction. Quite recently there has been a number of fresh attempts, of which the most sustained and ambitious, by a group of Finnish scholars, has been described in the previous issue of this journal. It is based on the assumption that the language spoken in the Indus cities was a form of Proto-Dravidian. The detailed methods used in this attempt at decipherment have been briefly described in the previous articles, and they need not be repeated here. Instead it is proposed to examine the handling of the Dravidian material, which, as will be seen, is open to considerable criticism.

That the language spoken in the Indus cities was an early form of Dravidian is certainly a possibility, and the existence of the Brahui language not far away can be taken as an argument in its favour. It must, however, be remembered that to judge by all analogy the linguistic pattern in the Indian subcontinent at this early period is likely to have been exceedingly diverse. Such is known to have been the case in the Near East and the Mediterranean region at this early period, and the situation in the Americas before the European invasions, at a somewhat similar level of cultural development, is also available for comparison. The later spread of Indo-Aryan over the greater part of the subcontinent is likely to have submerged a much greater variety of languages and language families than the number which has managed to survive.

In view of this consideration, I should estimate the degree of probability of the Indus language having been Dravidian as considerably less than the authors of the pamphlet. It remains, however, a distinct possibility, and an attempt to decipher the language on this basis is perfectly legitimate. It would also, however, be possible that the language was connected with Burushaski, or that it belonged to a family which has become extinct. The Munda languages can probably be left out of account, since their location is in Eastern India, and their connexions are with South-East Asia.

Another point to be borne in mind is the period of time, not less than 2,000 years, which separates the period of the Indus civilization from the earliest recorded Dravidian, that is to say Old Tamil. In such a long period there must have been considerable linguistic development, and if the Indus language was Dravidian it must have differed considerably from the existing Dravidian languages. There is obviously considerable danger in using these later foıms of Dravidian to decipher this ancient script, and this becomes clear when we examine the detailed comparisons proposed.

An essential part of the theory is provided by the interpretation of certain signs which are considered to represent the genitive and dative case terminations. The sign representing the genitive is supposed to represent a ship, and this is taken to be Drav. *ōṭam*, ship used to represent a termination *-ŏṭu*, which functions in Tamil as an instrumental. This involves the assumption that the Tamil termination has changed its meaning, and for this there is no supporting evidence. The idea that the alternative Tamil termination *-iṉ* is more recent, and has replaced *-ŏṭu* which in consequence shifted to instrumental function, is unacceptable because the two coexist in the earliest language and because parallels in other Dravidian languages show *-iṉ* to be ancient.

It would have been somewhat more straightforward to compare Tamil genitive termination *-uṭaiya*, but this also would not be satisfactory because this particular termination has arisen within the historical development of Tamil itself. It is also wrong to assume ‘ all the suffixes of the oblique cases in Dravidian developed

from words which had once been independent '. In all languages there is a basic nucleus of terminations which cannot be explained in this way, and which therefore may be called true case terminations. This is particularly so in the case of the genitive, and wherever the case is formed by means of postpositions (originally independent words), such as Ta. *-uṭaiya* and Te. *-okka*, these are demonstrably of secondary origin. It should also be noted that a proper comparative and historical study of the Dravidian declensional system has not yet been done, so that we are not in a position to decide what the Primitive Dravidian form may have been. It is, however, sufficiently clear that neither the Tamil instrumental termination *-oṭu* nor the genitive termination *-uṭaiya* can qualify for this role.

In the case of the dative termination we are on somewhat firmer ground as regards the primitive Dravidian form since forms corresponding to Ta. *-ku*, *-kku* are so widespread throughout the Dravidian languages that *-ku* can reasonably be set up as the original termination. Here the final vowel is a euphonic or auxiliary vowel of a type normal in South Dravidian at the end of words, so that the termination is reduced simply to the consonant *-k*. Since the termination consists of a single consonant it is difficult to see how a homophone can be found in accordance with the method adopted. What the authors have done is to assume that the sign supposed to represent the dative termination is a picture of an arrow (which it very well could be), and this identified with *koṭi*, ' tip, point ', which is further equated with *koṭu*, *koṭi*, ' to give '. It is not clear from the statement whether this sign is supposed to represent the dative case by virtue of the initial *k-* which appears in the words quoted, or whether the verb *koṭu* which is got by this method is considered to represent the meaning of the dative case through its own meaning (in which case the phonetic form of the case termination would be irrelevant). There are also the following objections to the procedure. In the first place there is only one form of the verb ' to give ', namely *koṭu*, and the alternative **koṭi* is due to a misunderstanding. Secondly, a glance at the entry in DED 1704 will show that among all the various meanings of the words registered there the meaning ' point or blade of arrow ' is conspicuous by its absence. Furthermore, we can be reasonably sure what the Primitive Dravidian word for arrow was, namely

ampu, which is consistently represented throughout the great majority of the languages. This is what the sign should stand for if it represents an arrow. Some comment is also necessary as regards the verb. It will be seen from DED 1708 that *koṭu* 'to give' is confined to the South Dravidian languages. On the other hand, there is a verbal base *ci-* (DED 2138) which is found throughout almost the entire family. If one is to reconstruct the Primitive Dravidian word for 'to give' it is clear that this is the word which should be chosen.

There are two points to be considered. Firstly, not all the items listed in DED can with certainty be attributed to Primitive Dravidian. This applies particularly to words which are shared by two or more South Dravidian languages, but which are only attested at a recent date. When there is no trace of such words in old literary texts, particularly in Tamil, the oldest, such words cannot be assigned with confidence to the primitive language. It is therefore necessary to consult not only DED, but also the historical dictionaries of each language, to ascertain whether the word is really ancient. Also, the main South Dravidian languages have borrowed from one another to some extent, so that a common item does not necessarily represent a common inheritance, but is rather a word which has spread through the group in more recent times. It was not, of course, feasible to distinguish such items in DED, in the absence of the necessary preliminary work. The second point (which is often tied up with the first) is that there are items in DED concerning which it is not easy to say for certain whether they are borrowings from Indo-Aryan or vice versa. In the process of compiling DED a considerable number of items derived from Indo-Aryan were collected. It was eventually decided to exclude these from DED, and in due course the collection was separately published under the title *Dravidian Borrowings from Indo-Aryan.* In addition to these there remained a residue of items about which there was uncertainty whether they were borrowed from Indo-Aryan or vice versa. Such items were given the benefit of the doubt and included in DED. Although items of these two kinds do not figure largely against the bulk of the material in DED, they are represented to a surprisingly large extent in the material selected by the authors of this attempt at decipherment, and this fact constitutes one of the major weaknesses of their case.

An obvious example of this kind is the word meaning a mnori priest or attendant on an idol (DED 2514; compared with 2510 *tampaṭṭam* 'drum'), a modern and localized word possibly to be connected with words meaning 'younger brother' (DED 2513). There is no chance that this could represent an ancient name for 'priest' which could have been in use also in the language of the Indus cities. It may also be added that the claim of the word meaning 'drum' to be Primitive Dravidian is not very convincing. It is not attested in Tamil until a comparatively modern date, and it is structurally suspect from this point of view.

Another modern and uncertain item is DED 3910. Ka. *manave* 'petition, etc.', which is utilized in connexion with Ta. *maṉ* 'king', etc. (DED 3909). This word is quite modern in the three languages, and it cannot possibly be regarded as representing anything in Primitive Dravidian. The Kannada word is given by Kittel in small type, by which he indicates that the word is not native Kannada. He does propose an etymology, but he may well have been thinking of Mar. *manāviṇeṃ* 'to conciliate', which could be the origin of the Dravidian words. Anyhow this item cannot possibly be used in any attempt to interpret the Indus script.

Similar objection may be raised against the citation of DED 3789, Ta. *mañci* 'cargo boat with a raised platform', which is compared with the Sumerian *magilum*-boats coming from Meluḫḫa (identified with the Indus region). This word is also recorded only from the modern period. In view of the fact that it denotes specifically 'a cargo boat with a raised platform' it is without much doubt derived from Sanskrit *mañca-* 'platform' or from some later Indo-Aryan form of the same word (CDIAL, no. 9715).

The authors have made use of another word for boat in connexion with termination of the genitive case, as summarized above, namely Ta. *ōṭam*. The same objections apply to this, since reference to the Tamil lexicon shows that the word does not appear in that language until a very late period. It is also one of the entries in DED where there is some doubt whether it is ultimately of Dravidian or Indo-Aryan origin. It was retained in DED largely because the Sanskrit word is only lexical. It is, however, well enough represented in the modern Indo-Aryan languages (CDIAL,

no. 1474, *hoḍa-*). The chief objection against Dravidian origin is the initial *h-* of Sanskrit *hoḍa-*, which cannot be explained on this assumption. On the other hand, the dropping of the *h-* if Dravidian borrowed from Indo-Aryan is what one would expect (in a popular, not a learned borrowing). This fact, coupled with the absence of the word in early Tamil literature, means that the Dravidian origin of the word must at least be regarded as doubtful, and so the word is not suitable to be used in an attempt to decipher the Indus script. It should be noted in passing that the other Indo-Aryan words quoted in DED 876 should be excluded from that entry. They are a different family, and are correctly treated separately in CDIAL, no. 9308.

DED 4177, Ta. *mēṭṭi* 'chief, head, etc.', is utilized in connexion with DED 4183. Ta. *mēḻi* ' plough-tail ', etc. There is no objection to the latter being Primitive Dravidian, but there are doubts about the former. Ta. *mēṭṭi* turns out to be quite a modern word. On the other hand, Te. *mēṭi* is well represented in literature from the earliest texts. There seems little doubt the Ta. word is borrowed from Telugu. This being the case, the Te. word can best be accounted for as the regular development in that language out of **mēl-ti*, in which case this entry should go with DED 4173, Ta. *mēl*, etc. Consequently, no Primitive Dravidian **mēṭi* ' head, chief ' can be reconstructed.

DED 83, Ta. *aṭṭam* ' upper story ', etc., which has been utilized for the decipherment, is another doubtful item. It was retained in DED as one of the items whose ultimate origin appeared uncertain. On the other hand, Kittel had no doubt on the question of its derivation from Indo-Aryan. The word in Tamil is quite modern, which is an argument against its being native Dravidian. It is well represented in the modern Indo-Aryan languages (CDIAL, no. 180, 185) and it is attested in Sanskrit from the Epic onwards (*aṭṭāla-*, Ep. *aṭṭa-* Kāl.). On looking at the entry again it seems most likely now that the Dravidian words are in fact taken from Indo-Aryan. In any case it cannot be reliably used in connexion with the Indus script.

A considerable part is played in the decipherment by a sign which appears to represent a comb. This is referred to as DED 3607, Pa. *penḍeḍa* ' comb ', etc., and on the assumption that this

represents Primitive Dravidian *peṇṭi* it is used in combination with DED 3608, Ta. *peṇ*, *peṇṭu*, Ma. *peṇ*, *peṇṭi*, etc., in an attempt to show that this sign represents the feminine gender. The correspondences between the various words in DED 3607 (with Suppl.) are somewhat irregular but in so far as it is possible to construct an original form, this would not be **peṇṭi*, but **paṇiya* or **paṇiga*. This is very close to the Prakrit words *phaṇaga-*, *phaṇiha*, quoted in DED Suppl., and since these are quite ancient (early Jain canonical literature), and since the Dravidian words are much less anciently attested, unknown to Tamil, and showing some indication of having been borrowed from language to language, the possibility that the Prakrit word is original and the Dravidian words borrowed from it has to be seriously considered. This being the case, it should not be used in connexion with the decipherment of the Indus script.

The above are examples of words which have been used in the decipherment, but which cannot with any confidence be ascribed to Primitive Dravidian. There are also some where not enough notice has been taken of the phonetic developments involved. This is the case with the equation Ta., etc., *āṟi* 'wheel' (DED 340) with *āḷ* 'to rule' (DED 341). This has also been used in an attempt to establish a phonetic change *ṟi*>*ḷ* which is then applied in the interpretation of the plural forms. In the case of DED 341 it will be seen the Te. form is *ēlu*, and the significance of this alternation has now been made clear by the occurrence in some Tamil inscriptions of an alternative form *yāḷ*, and this must now be established as the Primitive Dravidian form. Starting from this, a homophone would be provided by Ta. *yāṟ* 'lute' (if one is prepared to ignore the difference between *ḷ* and *-ṟ*), or Ta. *yāḷi* 'lion' (if the final *-i* is ignored), but not by Ta. *āṟi* 'wheel'.

There is an equation made between DED 2869 Ta. *toṭṭi* 'yard, pound', etc. (and also DED 2927 Ta. *tōṭṭam* 'garden', etc.) with DED 2875 Ta. *toṭṭa* 'big', etc. The last item cannot be used without further analysis; Ta. *toṭṭa* is a late loan from either Ka. or Te. *doḍḍa*. Apart from the secondary voicing of the initial the latter form contains a double voiced consonant *-ḍḍ-* which cannot possibly be taken back to Primitive Dravidian. It must have resulted from some assimilation (DED 2935 Ka. *tōra* could possibly

be connected, in which case *doḍḍa* might go back to **torḍa*). In view of this DED 2875 cannot be used to establish a homophone with either of the other two items.

Uncertainty about the original Dravidian form is particularly to be noted in the suffixes of the plural. It is assumed in the procedure of decipherment that the language behind the Indus script had a plural suffix *-kaḷ* as in Tamil. There are, however, other suffixes to be taken into account, *-ḷ* (*-ḷu*) represented in Telugu, Parji, etc., *-k* in Gondi and Brahui, *-ka* in Kui, and many other complications which need not be listed here. Setting up a Primitive Dravidian form under these circumstances is obviously difficult, and it certainly cannot be taken for granted that the form which appears in Tamil was also current at the other end of India 2,000 years earlier. One might expect in view of the evidence of the more northerly Dravidian languages, particularly of Brahui, that the ancient suffix is more likely to have been *-k*. It has been suggested that the Tamil plural suffix is a conflation of the two simpler suffixes *-k* (*-ka*) and *ḷ*. If this is so, it will have been of more recent origin than the simpler suffixes, so one would hesitate to operate with it in connexion with texts dating to before 2000 B.C. Even if this accepted, there is the further difficulty that the compound suffix appears in two forms, *-kaḷ*, as in Tamil, and *-kuḷ*, as in Parji (>*kul*), etc. In view of the great variety of possibilities, the odds are against the ancient plural suffix having been *-kaḷ*, as in Tamil, which means that it cannot be reliably used in the process of decipherment.

It is to be concluded from the above survey of the Dravidian material employed, and leaving aside other aspects of the method of decipherment, that there are far too many uncertainties involved to accept the deductions proposed. Far too many items have to be excluded as being certainly not ancient, and when not impossible other reconstructions remain uncertain. It does not appear, on the evidence before us, that the claim to have deciphered the Indus script can be accepted.

Dravidian Parallels in Proto-Indian Script

IRAVATHAM MAHADEVAN

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0. METHODOLOGY

0.1. This paper presents in brief outline a new interpretation of the Proto-Indian script within the Dravidian frame-work.

0.2. The long quest for an understanding of this script has entered an exciting and perhaps decisive phase with the recent publication of the preliminary results achieved by the Soviet and the Finnish teams of scholars working in the field. Their work has placed the investigations for the first time on a scientific basis and represents a major break-through. The methodology adopted by both the teams is broadly the same *viz.*, the determination of the functional characteristics of each sign by statistical-positional analysis and ascertaining the probable phonetic value by the technique of homophony applied after linguistic reconstruction. While there are differences in the identification of individual signs, as there are bound to be at this preliminary stage, both the teams

are agreed on three fundamental results: (*a*) the language is Dravidian, (*b*) the signs are mostly logographic and based on the principle of homophony, and (*c*) the inscriptions generally read from right to left. This is the basic groundwork from which I started. I acknowledge my indebtedness to the pioneering work of the Soviet and the Finnish teams and my work should be considered as following up their break-through.

0.3. There are, however, two main differences in our methods and approach to the problem which I should mention at the outset.

0.4. In the first place I have had no access to a computer. The positional-statistical analysis attempted by me is based on the conventional tools, pencil and paper. I have relied largely on the accurate Sign-Tables prepared by Hunter and the Sign Manuals in the original publications relating to Mohenjodaro and Harappa. I have supplemented these by preparing my own Tables from the inscriptions subsequently found at the minor sites like Chanhudaro, Lothal, etc. I have also made grateful use of the preliminary statistical data released by the Soviet and the Finnish teams. I believe, without in any way detracting from the excellent work done by the Soviet and the Finnish teams on the computer, that the relative smallness of the available sample lends itself to meaningful analysis by ' manual ' methods.

0.5. A much more important difference is my extensive application of the technique of parallelisms developed by Emil Forrer (*The Hittite Ideographic Writing*, E. Forrer, 1932, Chicago). I reproduce below extracts from the excellent summary of the method found in ' *Voices in stone—the decipherment of the ancient scripts and writing* ', E. Doblhofer, tr. by M. Savill, 1961, London, (pp. 181–185):

> " The method used by Forrer marks a decisive phase in the work of decipherment and we give here the broad outlines. Prior attempts had as their goal the phonetic reading of characters. Forrer maintained that an *objective comprehension*

of the contents of the inscriptions was essential. He quoted in this respect ideograms used in more than one language. We still use ideograms which are universally understood although they represent no determinate phoneme. Objective comprehension must, therefore, take precedence over the reading. But how to acquire this objective comprehension without being able to read a single syllable? There is in practice, maintained Forrer, one method: the observation of *parallel phenomena*. Parallels can occur,

(1) between the symbolical representation and the text;

(2) between the written object and its designation;

(3) between the written symbol itself and its meaning.

" A few brief examples will help to illustrate what Forrer means. The first case applies when their attitude, costumes and attributes obviously predict them as deities . . . Case (2) appears when one sees engraved on a sacrificial axe ' the axe of the High Priest '. . . . Case (3) is that of all ideograms which have remained comparatively close to their original form, as for example the old Sumerian character for ' star '.

" The three parallelisms, continues Forrer, already lead without phonetic reading to the determination of many lexical and grammatical points. But these are not the only possibilities afforded by the observation of the parallel phenomena. There is another priceless key: the similarity throughout Ancient East of certain portions of the inscriptions. Forrer quoted three particular features:

(1) The opening of royal inscriptions (' King, King of Kings, King of This and That ').

(2) The formulae of the curses (' whoever destroys . . . may the gods destroy ').

(3) The introduction to the letters (' A to B ').

"A simple comparison of these texts will reveal the signs employed for case-endings, pronouns, personal suffixes, demonstrative pronouns, relative and interrogative pronouns; also the adverbs, prepositions, conjunctions, particle and verb forms,—in short, the basic features of a grammar, *intelligible to the eye if not to the ear.* The originality, intelligence and lucidity of Forrer's work received the praise it deserved."

0.6. I have permitted myself this longish quotation as I have made the method of parallelisms the basic tool of my decipherment. I shall illustrate my adaptation of the method for the decipherment of the Proto-Indian script with a few examples.

0.7. Parallelisms will be valid only if the material used for comparisons is relevant. I have proceeded on the basic assumption that the material relevant to an understanding of the Proto-Indian inscriptions must be primarily Dravidian. Thus the apparently votive inscriptions found on the 'tiny' seals and prisms at the lower levels of Harappa may be compared with the earliest extant Dravidian votive texts in the Tamil-Brāhmī cave inscriptions. The seal texts may be compared with the earliest seal and coin legends in the Dravidian languages. The Proto-Indian graffiti stand comparison with those found on the megalithic pottery in South India. (This particular comparison has already been undertaken by B. B. Lal in his important Paper 'From Megalithic to Harappa: tracing back the graffiti on pottery', *Ancient India*, 1960, pp. 4–24). The seal-texts which presumably consist mostly of names and titles can be usefully compared with Dravidian name-lists compiled from the earliest available sources like the Tamil-Brāhmī inscriptions, the poems and the colophons in Tamil 'Sangam' works and from the vast material in the medieval temple inscriptions. The names of Dravidian tribes and the non-Āryan ethnic names preserved in early Sanskrit literature also constitute valuable comparative material. Since the archaeological evidence tells us that the Proto-Indian polity was highly organised and well-administered, it is particularly useful to collect and study

the technical terminology employed in Dravidian civic administration and palace and temple organisations. Lastly the myths and legends embodied in Dravidian literature and the oral tribal traditions may tell us much about the scenes portrayed on some of the Proto-Indian seals.

0.8. The example of , the most frequently recurring sign in the script is instructive. The Soviet and the Finnish scholars have identified the sign as an inflectional ending of the genitive case as it occurs mostly in the final position. It is well known that Sanskrit and Prakrit legends on coins and seals and in short votive labels (as at Sānci and Mathurā) have the names in the genitive. However, a comparison with the earliest Dravidian material in similar contexts showed that the observed frequency and distribution pattern of the sign is not matched even remotely by that of the Dravidian genitive. The names in the ancient Tamil coin-legends, graffiti and votive labels almost always occur in the nominative. I concluded, therefore, that the sign does not represent the genitive. It also occured to me that the best way to find the value of the sign would be to identify any frequently recurring element in Dravidian name-formations with functional-positional characteristics matching those of the sign and related to it through a homophone. This line of reasoning led to the identification of the sign as the masculine singular pronominal base **anṟ-* (O.Ta. *-aṉ*, *antai*) almost universally affixed to male personal names in Old Tamil. A similar comparison with ancient Dravidian names led to the identification of , a functional analogue of , as the nominal suffix **-ey* corresponding to Old Tamil *-i* or *-ai*. The recognition of these two symbols enabled me to pick out personal names and titles from the inscriptions. The decipherment had begun.

0.9. Another example of the parallel method based on grammar and syntax is my identification of the 'introductory' symbols in the texts as place-names. About 25 per cent of the names in the Tamil-Brāhmī inscriptions and almost 40 per cent of the names in the alphabetical list of Tamil 'Sangam' poets begin with place-

names. It seemed reasonable that the Proto-Indian seal texts followed a similar practice. This deduction is confirmed by the appearance of the three symbols, one of which ⊗ is identical with the Egyptian ideogram for a ' city '. Starting from these premises I was able to identify two of the symbols as representing the Citadel and the Lower City respectively, the fundamental units of the Proto-Indian polity.

0.10. An even more important application of the method of parallelisms is in regulating the interpretation of the symbols and the selection of suitable homophones. One of the criticisms made against the methods of decipherment developed by the Soviet and the Finnish teams is that there are too many choices available at too many levels to inspire confidence in the correctness of any of them. Choices have to be made at every stage in the interpretation of the pictorial and the positional values of the symbols and the selection of homophones. Thus the identification of a symbol as representing, say, a ' mortar with pestle ' is only the beginning. The symbol might have been intended to represent either the mortar or the pestle or the verb ' to pound '. Each of these ideas is indicated by several words in Dravidian languages and many of them offer homophones signifying a wide range of meanings. The positional characteristics of the symbol can help to limit the choices available. The method of parallels furnishes another powerful tool for narrowing down the choices and to increase the degree of probability as more and more parallels are thrown up which cannot all be reasonably ascribed to mere coincidence or clever contrivance. This is illustrated by the identification of the ' modified fish ' signs as personal and clan names.

0.11. Names are among the most conservative elements in any language. It appeared reasonable to look for parallels between the Proto-Indian symbols and ancient Dravidian names. The ' fish ' symbols which comprise about ten per cent of the texts and generally occur in the middle positions, seem to indicate personal names derived from planetary deities. The discovery of Heras

that the words for 'star' and 'fish' (*mīn*) are homophones in Dravidian languages began the whole process of decipherment. The 'fish' symbols often occur in clusters of two or three, the most common being the pair . The Finns have identified this pair as Saturn and Venus and believe that it represents a 'planetary conjunction'. I, however, concluded from Dravidian parallels that the 'fish' clusters correspond to the composite personal names so commonly found in old Tamil literature. It seems possible to employ the technique of parallelisms to find a solution. We have to search for two frequently occurring Dravidian names which should satisfy three criteria :

(*a*) linguistic connection with the words for Venus and Saturn ;

(*b*) occurrence as a pair ; and

(*c*) in either order.

The Old Tamil names *mā vēḷ* and *vēḷ mā*- assumed by almost all the Vēḷir chieftains satisfy all the criteria. Then followed the recognition that the dual meaning of *vēḷ* in Old Tamil (a chieftain ; to perform a sacrifice) is a survival from the times when the priest was also the ruler in a social order which was certainly non-Āryan and probably pre-Āryan. This deduction was then linked to the persistent and strongly-held traditions about the origin of the Vēḷir from a 'pit' or 'pitcher', their descent from sacerdotal forbears, their migration from Dvārakā and affinity with the Yādavas (also a non-Āryan people). Thus a grid of parallels is built up which progressively makes the identifications more and more cling together until the validity of the decipherment is objectively demonstrated.

0.12. The model of decipherment set up by me is quite different from that suggested by the Finnish team. (The Soviet Papers have so far mainly dealt with methodological considerations except for the tentative identification of half a dozen signs). The differences arise mainly from different interpretations of the objects represented

in the pictograms and of the functional values to be attached to the signs. The choice of homophones and the methods of linguistic reconstruction also vary. It also appears to me that by a curious mischance (-Chance does play a part in this game, computer notwithstanding!—) the interpretation of all the four signs which are basic to the Finnish model, *viz.*, their genitive, dative, plural, and 'feminine' suffixes has turned out to be incorrect. What, however, matters most at the present stage is the emergence for the first time of a coherent 'school' of decipherment working within the same framework and accepting the same methodological discipline. Hence the results, even if widely different, have become comparable and can be corrected and improved upon by constructive criticism. It is this development which kindles the hope that we are at long last on the threshold of a true decipherment of the Proto-Indian script.

0.13. *Acknowledgments :* It is with pleasure that I acknowledge the guidance I have received from Dr. Suniti Kumar Chatterjee and Dr. Bh. Krishnamurti, particularly on problems of linguistics. I am most grateful to Dr. Romila Thapar for her constant encouragement and her assistance during my search for historical parallels. I should, however, make it clear that the responsibility for the conclusions is entirely mine. I am beholden to the Director-General, Archæological Survey of India and the National Museum authorities for the facilities given to me to conduct my research.

Note : 1. The system of transliteration and the standard abbreviations used in the Paper follow the *Dravidian Etymological Dictionary*. Some popular spellings are however retained, e.g., Chēra, Chōḷa, Pāṇḍya, 'Sangam', etc.

2. (-*v*) stands for an indeterminate vowel at the end of a word.

3. The symbols of the script should be read from right to left.

1. THE NOMINAL AFFIXES

The Symbol Ʋ :

1.1. This is the most familiar symbol in the Proto-Indian script. Previous work in the field has already established the following positional and functional characteristics of the symbol :

(1) It is the most frequently used symbol in the script. According to the preliminary statistical data released by the Finnish team, the symbol occurs 873 times in 1944 inscriptions comprising 9147 total occurrences of all the symbols.[1] Thus almost one-tenth of the total material is accounted for by this single symbol.

(2) The most marked characteristic of the symbol is its terminal position at the end of the inscriptions. Kondratov has estimated that about thirty per cent of all the inscriptions end with this symbol.[2] The Finnish count of 627 final occurrences (32.25 per cent of the number of inscriptions) is in close agreement with the Soviet estimate.[3]

(3) The symbol acts as a terminal sign even when it occurs in the middle of the texts. This was noticed by Gadd and Smith at the time of the first tabulation of the symbols and was rigorously demonstrated by Hunter and more recently by the Soviet and the Finnish teams.[4]

(4) The symbol is found affixed to single signs or well-defined groups of signs which appear by themselves to be complete words as shown by Hunter.[5] In Soviet terminology, the symbol belongs to the class of variable signs ‘ which can replace each other, join in pairs, or disappear ’.[6] Kondratov has counted 146 different recurring ‘ blocks ’ or polygrammes with this symbol in the final position.[7]

(5) The symbol occurs occasionally (12 times according to the Finnish team) at the beginning of the inscriptions.[8]

1.2. The almost constant terminal position of the symbol led Langdon to the conclusion that it must be a post-fixed determinative or an inflectional case-ending.[9] Hunter, however, showed that the great frequency of the symbol precluded the possibility of its being a determinative.[10] He seemed to have considered the possibility of the symbol being a case-ending, but finally decided that it represented a suffix, " not in the sense of a grammatical suffix, but as a suffixed element, ' servant ' or the like, used in the formation of proper names ".[11] Knorozov pointed out that the symbol is one of the variables which occur " in the position usually occupied by form-building suffixes and other morphological formants ".[12] The Finnish team has also described the symbol as an inflectional ending on the basis of its positional and functional characteristics.[13]

1.3. The behaviour of the symbol as a suffix suggested to more than one scholar the possibility that it could be the suffix of the genitive. Hunter briefly considered the possibility, as stated earlier. Heras came to the same conclusion on the basis of a comparison with later Indian seals and coins which generally show the names in the genitive.[14] The Finnish team has also identified the symbol as the genitive suffix.[15] The Soviet suggestion that the symbol represents the Dravidian oblique or attributive case-morpheme is substantially similar.[16]

1.4. There is, however, no agreement among the scholars as to the object represented by the symbol. Hunter suggested that the symbol showed a jar with lip and handles on the basis of Egyptian and Sumerian analogies.[17] According to the Soviet team the symbol is a stylised picture of the *aśvattha* tree as indicated by some of the variants of the symbol.[18] The Finnish team sees the picture of a ship in the symbol on the basis of contemporary representations of Sumerian and Indus ships.[19]

1.5. The disagreement on the pictorial representation has resulted in different phonetic values being proposed for the symbol. Heras suggested the value *-adu*, as according to him, this was the most ancient form of the Dravidian suffix of the genitive.[20] He, however, did not attempt to connect the proposed phonetic value with the object represented in the symbol. Knorozov compares the Tamil name *atti* for the *aśvattha* tree with the Dravidian oblique case suffix, *-attu* (Ta.) and *-ti* (Te.).[21] The Finnish team connects *ōṭa(m)*, ' ship ' (DED. 876) with *-ōṭu*, the sociative case suffix and *-uṭai-(ya)* used as a genitive suffix in Tamil.[22]

1.6. A serious difficulty in the way of treating the symbol as an inflectional case-ending is its occasional presence at the beginning of a text. No inflectional ' ending ' can of course occur in the initial position. This objection can be met only by proposing different values for the symbol in the initial and final positions. Thus Hunter proposed that the symbol in the initial position was used simply as a syllable forming part of a word with probably no sense-connection with the symbol used as a suffix.[23] Heras pointed out that the word *-adu* proposed by him could also occur initially, but in the sense of a demonstrative pronoun.[24] More recently the Finnish team has turned to the same idea by suggesting that the symbol in the initial position could stand for an epithet or title meaning ' one who posseses '.[25]

1.7. Such an arrangement is, of course, possible. But there is some internal evidence to show that it is unlikely in this script. The symbols occur generally in a fixed order which has been shown by Knorozov to reflect the word-order in Dravidian.[26] Almost all the workers in the field agree that the script is logographic in which each symbol represents a word and not merely a sound.[27] We may, therefore, exclude the possibility of a purely phonetic syllabary. It is, therefore, preferable to search for a single value for the symbol, which is not inconsistent with its occurrence in the initial or the final positions.

1.8. There is an even more serious objection to the identification of the symbol as the Dravidian suffix of the genitive. Comparisons with the earliest extant Dravidian texts in similar

contexts (name-lists, votive inscriptions, legends on coins etc.) show that the observed frequency and distribution characteristics of the symbol are not matched by those of the Dravidian genitive suffixes. The Tamil-Brāhmī inscriptions, in marked contrast with the Prakrit votive texts, do not have even a single instance of a final genitive suffix.[28] The ancient Tamil coin-legends, again in sharp contrast with the Prakrit or Sanskrit coin-legends, almost always give the names of the rulers in the nominative case.[29] The Dravidian genitive is, more often than not, implicit even in the medial positions in a sentence,—the so-called ' zero-genitive ', e.g., *kō ātaṉ cel-l-irumpoṟai makaṉ peruṅkaṭuṅkōṉ makaṉ (i) ḷaṅkaṭuṅkō* (TBI., No. 56). Hence the symbol which is known to occur three times in a text of six symbols (one each in the initial, medial and final positions)[30] and which ends thirty per cent of all the Proto-Indian inscriptions is most unlikely to be the Dravidian genitive suffix.

1.9. In view of the foregoing conclusion, it is really not necessary to discuss the proposed phonetic values, treating the symbol as the genitive suffix. I may, however, observe in passing that the oldest and the most universal Dravidian suffix of the genitive is *-a*, as pointed out by Caldwell and attested by the Tamil-Brāhmī inscriptions.[31] The other genitive suffixes occurring in the Tamil-Brāhmī inscriptions are the locative-possessive *-il/-iṉ* and the oblique case *-t-* also used with locative and possessive meanings.[32] The most preferred construction was, however, by the use of the ' zero-genitive '.

1.10. I began the work on the identification of the symbol by making the following assumptions :

(1) Judging from our knowledge of seals used by contemporary ancient civilizations, it is reasonable to suppose that the bulk of the seal-texts would consist of names and titles with perhaps some minimal information relating to religious or economic activity.

(2) As the language of the texts appears to be Dravidian, the names and titles would be mostly in the nominative case, invariably so at the end of the texts.

(3) The most likely hypothesis which fits in best with the observed frequency, distribution and functions of the symbol would be to regard it as an integral element affixed to personal names and titles, generally as a suffix, but occasionally as a prefixed element.

(4) The best method to identify the value of the symbol would be to search for parallels among the most ancient extant lists of Dravidian personal names and titles in order to identify any frequently recurring element with positional and functional characteristics matching those of the symbol and connected with it by a suitable homophone.

1.11. The Dravidian materials chosen for the comparative study are :

(1) *The Corpus of the Tamil-Brāhmī Inscriptions :* [33] These inscriptions are dated from the Third or the Second Century B.C., and are the most ancient lithic records extant in any Dravidian language. Their votive context, their contents confined mostly to names and titles and their brevity make them the ideal linguistic material for the present comparison.

(2) *The name-lists of Tamil ' Sangam ' poets :* [34] About 473 names of poets have been preserved in the colophons to the poems of the Sangam Age, datable to the first three or four centuries of the Christian Era. The names represent an almost complete cross-section of the ancient Tamil society and include those of princes and commoners, men and women, and persons belonging to various clans and professions. There is little doubt that the names (which are among the most

conservative elements in any language) represent a tradition going back much farther than the dates of the composition and the compilation of these poems.

1.12. The most frequently recurring element in the formation of Old Tamil names turns out to be *-aṉ*, the masculine singular pronominal suffix of the Third Person, meaning, 'he, that man'. The evidence on this point is conclusive.

1.13. The Corpus of the Tamil-Brāhmī Inscriptions contains 98 composite personal names and titles, in which the suffix *-aṉ* occurs 99 times. Twenty out of the 74 inscriptions (excluding two *akṣara-bandhas*) i.e., about 27 per cent, end with *-aṉ* in the final position; (verbal forms ending in *-ǎṉ/ōṉ* are not included in this count). In a number of composite names, the suffix *-aṉ*, occurs twice or even thrice e.g., *maṇi-y vaṇṇakkaṉ tēvaṉ cāttaṉ* (TBI, 72).

1.14. A random sampling of the first one hundred composite names from the alphabetical list of the Sangam poets yields similar results. The suffix *-aṉ* occurs 82 times in these names. The suffix occurs 61 times in the final position (ignoring the honorific *-ār*, conventionally added in the colophons to the poets' names). The relatively high proportion of the suffix in the final position is doubtless due to the fact that while these are purely name-lists, the Tamil-Brāhmī inscriptions (and, presumably, the Proto-Indian seal-texts) often contain in the final position the names of the objects owned or gifted. Again many of the composite names in the list of poets contain the suffix *-aṉ* twice or thrice, e.g., *Iṭaiyaṉ cēntaṉ koṟṟaṉ-(ār)*.

1.15. In the light of this evidence from the nearest parallels, it seemed reasonable to suppose as a provisional working hypothesis, that the symbol in question probably represents the Proto-Dravidian equivalent of the masculine singular pronominal suffix of the Third Person (*-aṉ*, in Tamil).

1.16. Before proceeding further, it is pertinent to point out the true significance of pronominal suffixation in ancient Dravidian

names. In modern Dravidian languages, pronominal suffixation to nouns serves three purposes :

(*a*) to indicate number and gender ;

(*b*) to form appellative nouns ;

(*c*) to serve as honorifics.

There is, however, evidence to show that the earliest purpose of pronominal suffixation to personal names or titles was honorific and that the indication of number and gender was only incidental. The Tamil-Brāhmī inscriptions have three instances of *-uvaṉ* used unmistakably as a honorific suffix (TBI., No. 1–3). In medieval Tamil inscriptions we come across a similar honorific usage for *-avaṉ*, e.g., *cuvaraṉ māṟaṉ-avaṉ eṭuppitta paṭāri kōyil.* Later developments in Tamil when *-aṉ* lost its honorific force due to constant usage and became a mere nominal suffix, only confirm this supposition. The plural pronominal suffixes, *-ar*, *avar*(*-kaḷ*), were than added to or substituted for the singular *-aṉ* to express respect e.g., *kiḻār*, *makaṉ-ār āciriyar-avarkaḷ* etc. In the light of this evidence it is reasonable to infer that in the early stage of Dravidian met with in the Proto-Indian inscriptions, the pronominal suffix was added to personal names or titles only as an honorific.

1.17. Pronominal suffixes of the type *-aṉ* are derived from *a-*, (D.E.D. No. 1), the demonstrative base expressing the remoter person or thing. Comparisons of such forms like *avaṉ* (Ta., Ma.), *avn* (Ko.), and *avën* (Koḍ.), with those like *vā*(*ṇ*)*ḍu* (Te.), *ōnḍ* (Ga.) etc., enables us to reconstruct the PDr. form *(*a*)*nṟ*-(*v*). It will be seen that while Tamil has lost the final consonant, Telugu drops optionally the nasal. The change *-ṉṟ*>*-ṇḍ* (Te.) is regular (*vide* Phonetic Correspondences in DED).

1.18. Many of the Dravidian languages have masculine singular pronominal suffixes of the Third Person belonging to another related series also formed from the Dem. *a-*, e.g., *āta* (Ka.), *ătanu* (Te.), *ath* (To.) etc., (DED No. 1). The Old Tamil equivalent is

a(n)tai (not recorded in DED or *Tamil Lexicon*), which seems to have gone out of use even in the Sangam works in free form (though occurring fairly often in bound form) and has been recovered only recently when the Tamil-Brāhmī inscriptions were deciphered. In these inscriptions *a(n)tai* occurs as a honorific affix to male personal names. It is recorded 14 times, prefixed six times and suffixed eight times to male personal names. A study of the following examples will make the pattern of its usage clear :

(1) as a prefixed honorific : .. *antai-y Pikaṉ* (TBI, 13)

(2) as a suffixed honorific in free form : .. *Kuvīra antai* (TBI, 25)

(3) as a suffixed honorific in bound form : .. *Koṟṟantai* (TBI, 65)

(4) as a suffix to place-name to indicate the male person's status therein : .. *Patiṉ-ūr atai* (TBI, 23)

(5) In kinship terms with pronominal possessive prefix : .. *tantai-y* (TBI, 2)

A careful study of these examples will show that in names like *Koṟṟantai*, the final term is the honorific suffix *-antai*. Compare with *kuvīra antai*. In two adjacent inscriptions (TBI, 58–59) the words *Piṭaṉ* and *Piṭantai* occur as synonyms, proving the honorific use of *-antai* and the functional equivalence of *-aṉ* and *-antai*. The terms *antai* and *atai* occurring in these early inscriptions are closely related to the Old Tamil honorific suffixes *-attai* (here masculine, as in *añci-y-attai*) and *-attaṉ*. By a natural extension of meaning, male personal names like *āntai*, *anti*, *antuvaṉ*, *atti*, *ătaṉ*, etc., and kinship terms like *t-antai*, *e-ntai* etc., are formed from the honorific usage of the pronominal base. A comparison of all these forms enables us to reconstruct *-*ant*- as the dem. pronominal base for *antai*. It will also be seen that *-*anṟ*- and *-*ant*-, the basic forms of the two series of affixes are allomorphs and we can, therefore, posit a single PDr base *-*anṟ*-

for the whole series of masculine singular pronominal affixes of the Third Person meaning ' he, that man ', used honorifically.

1.19. The identification of the symbol as the masculine singular pronominal affix of the Third Person used as a honorific with male personal names and titles explains satisfactorily the high frequency of the sign and its normal terminal position in seal-texts presumably consisting mostly of male names and titles. This identification also explains the multiple occurrences of the symbol in the same text. It has also been shown that while the pronominal honorific was normally suffixed, there are quite a number of attested cases in the Tamil-Brāhmī inscriptions where it is found in the initial position. There is to my knowledge no other recurring element in Dravidian name-formation which can so remarkably match the observed frequency, distribution and functional characteristics of the symbol under discussion.

1.20. The pictogram U seems to suggest some kind of a vessel with handles or pronounced rim or lip at the mouth and a tapering bottom. Some of the variants copied by Hunter would seem to make this indentification almost certain.[35] Once the symbol is recognised as representing a vessel, the following etyma denoting several types of vessels of a generally similar form suggest themselves as good homophones for comparison with **-anṟ-* :

DED. 110 : *aṇṭai* (Ta.) : squirt ; *aṇḍe* (Ka., Tu.) : vessel made of hollow bamboo etc., generally with a handle ; *aṇḍy* (Ko.) : milk-pot, bamboo pot ; *aḍy* (To.) : clay-pot ;

DED. 107, 109 : *aṇḍige* (Ka.) : one pannier ; *aṇḍemu* (Te.) : ibid. ; *aṇḍu* (Ka.) : bottom of a vessel ;

Ta. Lex. : *antai* (Ta.) : an ancient weight (measure?) .

1.21. The following etyma having the general meaning ' male, elder person ' appear to be connected with the pronominal honorific **-anṟ*, meaning ' he, that man ' :

DED. 111 : *andra* (Kui.) : a male ; *aṇḍrā* (Kur.) : male (of animals) ; *aṇḍyā* (Kur.) : a haughty man ; *aṇḍīra* (Skt., lex.) : a male.

DED. 2494 : *tantai* (Ta.) : father ; *taṇḍri* (Te.) : ibid., etc.

1.22. The following personal, clan and dynastic names of Dravidian rulers are perhaps ultimately derived from the honorific usage of the pronominal affix **-anṟ-* :

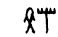
aṇṭiraṉ : a personal name of Āy. (*Puṟam.*, 129).

aṇṭar : clan name of chieftains of cow-herds (=*āyar*, *iṭaiyar*) ; (*Akam.*, 59).

ātaṉ : a common personal name among the Chēras.

āndhra : dynastic name of Āndhra Kings.

The Symbol :

1.23. The main characteristics of this symbol are its position as a terminal sign and its functional similarity with . Both the symbols function as terminal signs not only at the end of the texts, but also in medial positions. Only either of these two symbols is found ligatured with . In the quasi-final positions, both are followed by the same set of single variable signs. The preceding symbols or sequences in either case can be shown to be complete words by themselves, probably names and titles. There is, therefore, reason to believe that the symbol like its functional twin , is an integral suffix used in name-formations, as suggested by Hunter.[36] He was, however, mistaken in thinking that the sequences preceding the two symbols are mutually exclusive. Subsequent discoveries have shown that, there are, several symbols and sequences, notably-  ' which can end with either symbol.

1.24. The Soviet and the Finnish teams[37] regard the symbol as an inflectional ending on account of its terminal position and its alternation with other variable symbols, notably .

1.25. Knorozov has suggested that the phonetic value of the symbol probably corresponds to Ta. *-kaṇ*, the ancient suffix of the locative, as the symbol closely resembles the Sumerian pictogram *igi*, meaning 'eye' (*kaṇ* in Tamil).[38] The resemblance to the Sumerian pictogram was also noticed earlier by Hunter and Heras, and in fact, the latter adopted the phonetic value *kaṇ* in the literal sense, "eye, to see" in his readings.[39]

1.26. The Finnish team has identified the symbol as an arrow on the basis of a comparison with another Sumerian pictogram. According to them, the symbol functions as the dative case-ending, corresponding to Ta. *-ku*. Their attempt to derive the phonetic value *-k(u)* by acrophony (?) from *koṭ-* : 'end, point' (DED. 1704) and *koṭ-(u)* : 'to give' (DED. 1708) is however unconvincing.[40]

1.27. There are other objections to the Finnish identification. One does not expect seals giving the owners' names to end in the dative. This objection is sought to be met by the suggestion that the seals ending in ↑ are dedicatory.[41] However, Dravidian dedicatory or votive texts do not end in the dative, as may be gathered from the Tamil-Brāhmī votive texts and the thousands of medieval temple inscriptions in Tamil. Internal evidence from the seal-texts also appears to contradict the Finnish view. According to them, 'names of gods' can be identified by the dative case-ending. And yet it is curious that two of the most important 'deities' according to the Finnish decipherment, [sign] and [sign] are never followed by the supposed dative sign ↑ . In the circumstances, it is difficult to accept the proposed identification of the symbol as the dative suffix.

1.28. The functional similarity between Ʋ and ↑ clearly indicates that the latter is also likely to be a nominal suffix used in Dravidian name-formation. I have suggested that the symbol Ʋ is the masculine singular pronominal affix of the Third Person. It is, therefore, possible *prima facie* that the symbol ↑ could represent another grammatical category, say, the plural or the 'non-masculine' gender. However, the frequent addition of the

symbol to the single 'fish' signs makes it unlikely that it is the plural suffix. Again the 'fish' symbols, comprising about ten per cent of the total textual material and occupying the bulk of the medial positions in the texts, are unlikely to be in the non-masculine (=feminine) gender. The common sequences preceding U and ↑ also make it unlikely that the two suffixes represent mutually exclusive grammatical categories. I, therefore, started with the working hypothesis that the symbol ↑ represents another, and less frequent, element in the formation of Dravidian personal names and titles.

1.29. The comparative statistical data relating to the symbols U and ↑ are instructive. According to Kondratov, the number of 'blocks' ending with the symbols is respectively 146 and 48 (approximately 3 : 1). He also calculates that the percentage of inscriptions ending with either symbol is respectively 30 and 7 (4.5 : 1).[42] According to the Finnish team, the total occurrences of the two symbols are respectively 873 and 146 (approximately 6 : 1).[43]

1.30. The next step was to apply rigorously the method of parallelisms as illustrated in the case of U . The Dravidian linguistic material chosen for comparative study was subjected to a positional-statistical analysis to identify any recurring nominal element with characteristics matching those of the symbol ↑ .

1.31. The results speak for themselves. It turns out that the nominal endings occurring most frequently with old Tamil personal names and titles, next to the pronominal suffixes, are *-ai* and *-i* which may be considered together for reasons to be explained presently. The comparative statistics are as follows :

Names and titles occurring in	Pronominal suffix (*-aṉ*)	Nominal endings (*-i*, *-ai*)	Approximate ratio
Tamil-Brāhmī Inscriptions (98 names).	99	31	3 : 1
Alphabetical List of Sangam Poets (first 100 names)	82	33	2·5 : 1

The parallel is close enough to suggest that if represents the pronominal honorific (*-aṉ*, *-ant-* in Ta.), then is likely to represent the Dr. nominal endings (*-i*, *-ai* in Ta.).

1.32. The endings *-i* and *-ai* can be considered together for the following reasons :

(*a*) They are inter-changeable (e.g. *uṟ-i*, *uṟ-ai* : 'place' (DED. 588) ; *var-i*, *var-ai* : 'line' (DED. 4304).

(*b*) There was no diphthong in Proto-Dravidian. *Tolkāppiyam* (*eṟu.*, 54) clearly states that *ai* could be resolved as the vowel-cluster *a*+*i*.

(*c*) The *-ai* ending in Tamil could be traced to **-ay*, and the final *-y* here can be considered as the variant of an older *-i*. *Tolkāppiyam* (*eṟu.*, 56, 58) also mentions that the final *-i* becomes consonantalised to *-y* and that *-i* and *-y* alternate in the final position. The Tamil-Brāhmī inscriptions have many such pairs, (e.g.) *Kaṇi-i* (TBI, 3) and *Kaṇi-y* (TBI, 1).

1.33. The endings *-i* and *-ai* were probably independent formative suffixes originally ;

e.g., *vil-l-i* : an archer, a name, from *vil* : 'bow' ; *nikar-il-i* : 'one without equal', a title, from *nikar* (equal)+*il* (not).

1.34. The suffix *-i* is sometimes regarded as a non-masculine suffix which has been applied to masculine nouns at a later date. However, there is evidence from the earliest strata of literary works and inscriptions that the suffixes *-i* and *-ai* were also added to masculine nouns. Consider the ancient Tamil masculine names ending in *-i* like *añci*, *atti*, *aviṉi*, *eṟiṉi*, etc., and the *-ai* endings in *tantai* (masc.), *taṅkai* (fem.), *attai* (epicene), etc.

1.35. The archaic use of the independent suffixes *-i*, *-y* and *-iy* occurring in the earliest Tamil-Brāhmī inscriptions should be specially noted ; (e.g.) *kaṇi-i* (TBI, 3) ; *kaṇi-y* (TBI, 1) ; *tantai-y* (TBI, 2) ; *kāviti-iy* (TBI, 3) and *vaṟutti-iy* (TBI, 1).

1.36. We may, therefore, expect to find after the names and titles occurring in the seal-texts a nominal suffix corresponding to TBI, *-i(y)* and *-a-i(y)*.

1.37. It is easy to recognise the object in the pictogram . It is an arrow or a spear-head. Hunter has copied a variant (Table LXVIII, 1) which even shows the rivet-hole in the blade for fixing the arrow-head or the spear-head to the shaft.[44] Large numbers of copper and bronze spear-heads have been recovered from the sites of the Proto-Indian cities.

1.38. The recognition of the object in the pictogram as arrow or spear and the probable use of the symbol as a nominal suffix immediately suggest the following etyma with the meanings, "arrow, to shoot (as an arrow), to throw (as a spear) etc.": DED. 691 : *ey*, *ē* (Ta.) ; *ey-*, *iy-* (Ko.) ; *ēyu* (Te.) ; etc.

1.39. The result has to be interpreted with caution. The Ta. *-ai* has been reconstructed to PDr. **-ay*. It is possible that the corresponding nominal suffix was pronounced **-ey* or even **-iy* in the Proto-Indian dialect. It is equally possible that the homophony in this case was only approximate and not an exact indication of the 'real' Proto-Indian form. However, the correctness of the identification seems to receive support from the following circumstantial evidence.

1.40. The symbol occurs mostly in the digramme and with the other 'fish' symbols. There is reason to believe that the frequently occurring digramme is the generic name for the ruling class of the civilization, as judged from its frequency and positional and functional characteristics. The approximate phonetic value of the 'fish' sign appears to be **mīl/ṇ/ṭ-(v)* (See discussion, *infra*, on the 'fish' symbols). The digramme would then correspond to **mīḷ-ey* which should be compared with (*a*) *mīḷi*, *miḷai* (O.Ta.) : chief, great man, and (*b*) *mleccha* (Skt.) : name applied by the Āryans to the people encountered by them in India. The significance of this suggestion will be more fully discussed later.

Here it is relevant to note the regular phonetic correspondences, *ey-* (*ec-*), *eyk-*, *eg-*, *iy-* (*ic-*) etc., under *ey-* in DED 691.

1.41. While discussing the symbol U , it was suggested that the almost constant use of *-(*a*)*nṟ*, as a honorific probably led to the derivation of personal or clan names like *aṇṭiraṉ*, *aṇṭar* and *Āndhra* from the pronominal suffix. It appears likely that a similar development took place in respect of ☥ =*-*ey* also. Thus we come across *evvi* (*Puṟam.*, 24) and *eyiṉaṉ* (*Akam.*, 181) as clan or personal names among the Vēḷir. This is significant as there are several converging lines of evidence suggesting that the ancestors of the people known in Tamil history as the Vēḷir constituted the ruling classes of the Proto-Indian civilization.

2. THE PRIEST-RULERS

2.1. The five 'fish' symbols stand out prominently in the Proto-Indian inscriptions. Their striking graphic resemblances and their almost identical positional and functional characteristics make it reasonably certain that the symbols express similar or related meanings. They occupy about ten per cent of the textual matter.[45] The proportion increases substantially if the attributes and the suffixes forming integral part of the 'fish' words are taken into account. The 'fish' signs generally occupy the central portions of the inscriptions. The evidence thus appears to indicate that in some manner the 'fish' words constitute the core of the seal-texts.

2.2. The inescapable resemblance of the symbol to a fish was first noticed by Gadd and Smith who also observed that the modifications in the other 'fish' signs "are not particularly natural as indicating different kinds of fish".[46]

2.3. Hunter's meticulous analysis of the 'fish' signs has not, however, proved fruitful because of his pre-occupation with the supposed syllabic character of the signs. His conclusion that all the 'fish' signs and even the 'fish clusters' express one and the

same word with 'dialectal or phonetic' variations seems *prima facie* unacceptable. His suggestion that the 'fish' signs represented the Proto-Indian word for 'son' was a mere guess.[47]

2.4. The work of Heras on the 'fish' sign marks the true beginning of the decipherment of the Proto-Indian script.[48] His vital clue was that in almost all the Dravidian languages, the word for 'fish', *mīn*, (DED. 3999) also means 'a star or planet', (DED. 3994). The identification is crucial in establishing the logo-graphic character of the script, the principle of homophony underlying it and the possibility of the language being Dravidian. Heras also proposed that all the 'fish' signs read *mīn*, but expressed different meanings like, 'star', 'shining', names of persons, etc. Starting from these premises, he built up his theories that the people of the Proto-Indian civilization called themselves '*mīna*' and practiced an astral religion. While Heras was not on the whole successful in deciphering the script, his pioneering ideas, particularly regarding the 'fish' sign, have influenced the recent work of the Soviet and the Finnish teams.

2.5. The Soviet scholars have followed Heras closely in interpreting the symbol as **mīn*, with the meanings 'star or planet' and 'shining'.[49] Gurov has added the identification *mum-mīṉ* (Ta.) (*mṛgaśīrṣa*) to *aṟu-mīṉ* (Ta.) (Pleiades) already proposed by Heras. He has suggested that these combinations could also be interpreted as personal names. However, Gurov's identification of pictographically as the carp and his interpretation of the symbol as **kay* (*key*) with the meanings 'Mars, red' may be due to a false lead since it is certain that the modifications of the 'fish' signs are artificial and cannot represent different natural varieties of fish.[50]

2.6. The Finnish team's work on the 'fish' signs is of fundamental importance.[51] They have extended, in a very logical manner, the idea of Heras that represents a star or planet, by proposing that each of the 'modified fish' signs represents a different planet worshipped by the Proto-Indians. They have

proposed the following identifications which will be of great interest to students of Hindu religion and mythology, though an examination of their full implications is quite beyond the scope of the present Paper :

Symbol	Phonetic Value in O. Ta.	Planet	Colour	Deity
	ce-	Mars	red	Śiva = Rudra
	mā, māy, māl	Saturn	black	Viṣṇu = Kṛṣṇa
	veḷḷi	Venus	white	Balarāma
	poṉ	Jupiter	golden	Brahmā
	pay	Mercury	green	Gaṇeśa

2.7. The Finnish team has also made the following suggestions regarding the use of the ' fish ' symbols in the script :

(1) The ' fish ' signs represent the divine names of planetary deities in the dedicatory inscriptions.

(2) These also served as the personal names (of theophoric type) of people, mostly priests, in some seals.

(3) The ' fish blocks ' consisting of two or three ' fish ' symbols represent planetary conjunctions.

2.8. A comparison of Dravidian name-lists with the seal texts indicates that the symbols occurring in the middle of the inscriptions are most likely to represent personal names. Dravidian names exhibit a fixed word-order. The place-names occur first followed by clan or professional names and then by personal names which are generally composite. In votive inscriptions the final elements generally relate to the objects gifted. Consider the following examples :

mattirai-y poṉ-kolavaṉ ātaṉ-a tāṉa (TBI, 30)

vēṇpaḷi-i aṟuvaivaṇikaṉ eḷa-a aṭaṉ (TBI, 43)

pākaṉ-ūr pērātaṉ piṭaṉ itta vēpōṉ(TBI, 12)

I, therefore, started with the assumption that the 'fish' signs which are mostly confined to the middle portions of the texts, particularly of the longer ones, probably represent personal names and titles. This presumption was strengthened by the fact that the suffixes or which indicate that the preceding signs and sequences are names and titles, are almost invariably added to the 'fish' signs. Yet another pointer is the occurrence of the 'fish' signs in clusters of two and three strongly suggesting composite names of the Dravidian type.

2.9. The 'fish' symbols can be divided into three categories on the basis of their frequency and positional characteristics :

(*a*)

(*b*) and .

(*c*) and .

The Symbol :

2.10. The Finnish scholars interpret the digramme as 'red star' (=Mars) and further propose that the symbol should itself be regarded as representing Mars, though they interpret the symbol as 'star' when suffixed to numerals. If the digramme means the 'red planet', it is unlikely that alone will have the same meaning. The morphography of the group of 'fish' symbols seems to require the presence of modifying elements for the recognition of distinct meanings. The much greater frequency of and its general use as an affix seem to indicate that it represents the generic name for the class of persons denoted by the 'fish' symbols.

2.11. The homophony, *mīn* (fish)=*mīn* (star, shine), appears so irresistible that the phonetic value **mīn* has been accepted for the symbol by all the scholars working in the field within the Dravidian framework. A rigorous application of the method of parallelisms, however, shows that *mīn* does not occur as an element in ancient

Dravidian personal or clan names or titles. Even the word *mīṉavaṉ* cited by Heras and the Finnish team is only a periphrastic expression used in the literary works to describe the Pāṇḍyas or the fishermen tribes. The element *mīṉ* does not occur in any of the ancient Pāṇḍya names. There is also no evidence for the use of *mīn* as an epithet affixed to Dravidian personal names in the sense 'shining, glorious', etc. However, the technique of parallelisms requires that we should search for a widely used name or title associated with the meaning 'star, shine' and which can be connected with Proto-Indian names in some manner.

2.12. The clue came with the recognition that the intended homophone is probably **mīṇ*. Confer DED. 3994 for *miṇ*-forms, (e.g.) *miṇa* (Ka.), *meṇu* (Tu.), *miṇuku* (Te.). It appears likely that Proto-Tamil also had the **miṇ*-form, as indicated by *miḷ-ir* (Ta. Lex.): to shine, glitter (ṇ>ḷ). A parallel to the alternation between *miṇ* and *min* forms is provided by that of *viṇ* and *vin-u* in DED. 4422. Once the original form is recognized to be **miṇ*, rather than **min*, the possibility of alternations between *ḷ/ṇ/ṇṭ/ṭ* in this environment becomes clear. Compare *miḍugu* (Te.), *miḍkōs* (Go.), *bindke* (Malt.), (DED. 3994), and *miḷ-ir* (Ta. Lex.) These are regular phonetic alternations of the type exemplified by, say, *vēḷ*, *vēṇ*, *vēṇṭ-*, *vēṭṭ-* (DED. 4548, 4561). The reconstructed form is written **mĭ̄ḷ/ṇ/ṭ-(v)* (*m*=*v*; *i*=*e*), conventionally to indicate the possible alternant forms for the 'shine' words.

2.13. The recognition of the original form **mĭ̄ḷ/ṇ/ṭ-* for 'shine> star' immediately leads us to the old Tamil parallel *mīḷi* (DED. 3990): lord, chieftain, hero, great man, etc. The epithet *mīḷi* is derived from *miḷ-ir*: to shine, and is thus connected with **miṇ* (>mīṉ) form with the same meaning. The word *mīḷi* also occurs in old Tamil as *miḷai*, though the connection does not seem to have been recognised. However, there is clear evidence for this in the alternant name *mīḷi* (=*miḷai*)-*p-perum-patumaṉ-ār*, (author of *Naṟ*., 109). We should, therefore, interpret the word *milai*

occurring in personal names like *milai-k-kantan-ār* (*Kurun.*, 196), *milai vēl tittan-ār* (*Kurun.*, 284) as a title forming part of the personal names and not as the name of a place. In fact, the term *milai-nāṭu* (*Akam.*, 133 : 16) should be interpreted as the place of the *milai* and not connected with *miṭai* (*milai*) : bush (DED. 3991). It should be specially noticed that all the persons mentioned in the old Tamil works with the title *mīḷi/milai* appear to be Vēḷir.

2.14. We are now ready to interpret the most common digrammes occurring with the 'fish' symbol ; : **mĭl/ṇ/ṭ-(v)-ey* (cf. O.Ta., *mīl-i, mil-ai*) : lord, chieftain. : **mil/ṇ/ṭ-(v)-anṟ* (cf. O.Ta., *miṭal, miṭuk-k-an*) : strong, powerful, proud man : (DED. 3970).

2.15. It has been suggested earlier that the symbol represents the generic name or title of the class of people described by the 'modified fish' symbols. The suggested reading : **mil-ey* immediately invites comparison with *mleccha*, the term used by the Āryans to describe the people encountered by them on their migration to India (*mleccha*<**mil-ec*<**mil-ey*). It now appears from the decipherment of these symbols that the Mlecchas of the Rigveda were the chieftains of the Proto-Indian civilization, who called themselves **mil-ey* (lit., the resplendent) and whose names occupy the bulk of the seal-texts.

2.16. In the light of the evidence furnished by the decipherment of the 'modified fish' symbols (See *infra*), the identity of **mil-ey* and Ta. *vēl* also seems to be established. From the linguistic point of view it seems possible to propose the equation =**mĭl*=**vĕl-* on the basis of the alternations between *m* and *v* and between *i* and *e*. Compare *miṇ-*, *mil-* : 'to shine' (DED. 3994, 3990) with *vil-*, *vel-* : 'to shine, bright (DED. 4524), and *viṇ* ; 'sky' (DED. 4422).

2.17. The series of blocks formed by with prefixed numerals can now be interpreted differently. The symbol does not literally represent a star or a planet in any of the inscriptions. As we

have seen, it is the generic name of the rulers of the Proto-Indian civilization. My investigations of the numeral signs in the script have shown that

(a) where the numeral sign within a block is constant, it is not a 'true' number, but indicates a homophone with a different meaning;

(b) where the numeral sign within a block is variable, it represents a true number;

(c) since the elaborately carved and carefully preserved seals are most unlikely to be mere inventories of enumerated articles, the numbers must relate to persons organised in numbered groups like septs or phratries of the Dravidian tribes, or other assemblages.

2.18. Old Tamil parallels tell us that the Vēḷir were divided into numbered groups (most probably, exogamous phratries): (e.g.)

aim-peru-vēḷir : The Five Great Vēḷir (*Akam.*, 125)

eẓu-vēḷir : The Seven Vēḷir (*Akam.*, 36)

patiṉoru vēḷir : The Eleven Vēḷir (*Akam.*, 246)

patiṉāṉku vēḷir : The Fourteen Vēḷir (*Akam.*, 135)

patiṉeṇ kuṭi vēḷir : The eighteen septs of Vēḷir (*Tol.*) *Poruḷ.*, 32, *urai*)

2.19. The Dravidian custom of numbered septs can still be seen among the Gonds of Adilabad.[52] The names of their phratries are:

nal ven saga : The Number Four Phratry

si ven saga : The Number Five Phratry

sar ven saga : The Number Six Phratry

er ven saga : The Number Seven Phratry

Curiously enough the Gonds add up these numbers and consider that they have 22 phratries though the division is only four-fold. This is very instructive as a similar confusion may have resulted in the higher numbers mentioned in connection with the Vēḷir.

2.20. This discussion leads us to the conclusion that the 'numbered' fish-blocks relate to the phratry numbers of the rulers and not to stellar constellations. I should, however, mention that the digramme is in a special category as shown by the long strokes not used in the other numeral prefixes. This block possibly refers to a special group and reminds us of the Iruṅkō vēḷir who seem to have been a dominant group of Vēḷir (*Puṟam*., 201). It is also just possible that the prefixed numeral 'three' in (found in the upper register unlike normal numerical signs) indicates the homophone **mūnṟ-* : chief, eminent (DED. 4119) or *mūt(u)* : senior, old, (DED. 4053, 4057), cf. *toṉ mutu vēḷir* : 'The ancient great Vēḷir (*Puṟam*., 24). It is, therefore, not unlikely that the phratry numbers among the Vēḷir, as among the Gonds, ranged only from four to seven (combinations of which produce the numbers 11, 14, 18 or 22). The numeral signs 4, 6 and 7 preceding the 'fish' sign may therefore be regarded as phratry numbers (The omission of 5 from the series seems accidental). The absence of a plural suffix after the 'numbered fish' blocks confirms my suggestion that each block refers to one numbered phratry.

The Symbols *and* :

2.21. These are the most commonly occurring 'modified fish' symbols. In particular, they frequently occur paired in either order. The Finnish discovery that the pair represents the planets Venus and Saturn is of crucial importance, as it leads us directly to the recognition of who the rulers of the Proto-Indian civilization were. However, it does not appear from their published papers that the Finnish scholars have realised the significance of their own discovery. This is perhaps due to their belief that the symbols

represent, in the literal sense, planetary 'deities' and the paired symbols stand for 'planetary conjunctions'. Neither assumption seems to be correct. Each of the 'modified fish' symbols represents a personal name or title and the clusters of 'fish' symbols represent composite personal names and titles.

2.22. When this correction is effected, the technique of parallelisms can be employed to find a solution. We have to search for two frequently occurring Dravidian names which should satisfy three creteria :

(a) The names should be connected linguistically with the Dravidian terms for Venus (*Veḷ-*) and Saturn (*mā*) ;

(b) They should occur as a pair,

(c) in either order.

2.23. No sooner the criteria were determined, than the answer presented itself. The paired 'fish' symbols correspond to the old Tamil Vēḷir names : *mā vēḷ* and *vēṉ mā-*. Study the following parallels from Tamil Sangam works :

(i) Mā Vēḷ Ā-ay .. (*Puṟam.*, 135)

(ii) Mā Vēḷ Evvi .. (*Puṟam.*, 24)

(iii) Mā Vaḷavaṉ .. (*Paṭṭiṉa.*, 299)

(iv) Iruṅkō Vēṉ māṉ .. (*Akam.*, 36)

(v) Naṉṉaṉ Vēṉ māṉ .. (*Akam.*, 97)

(vi) Veḷi māṉ .. (*Puṟam.*, 162)

2.24. There is evidence that the names *mā vēḷ* and *vēḷ mā-* were not confined to the Tamil country. It is significant that the name *Mā vēla* occurs in the Chedi dynasty (*Mbh.*, I. 63). The Sanskrit names *Bali* (an ancestor of the Āndhras, according to the *Bhāgavatam*) and *Mahābali* seem to correspond to *vēḷ* and *mā vēḷ* (*bali*=*vēl*=sacrifice). The Rigvedic references to *Vailasthānaka* and *Mahāvailastha* as the 'ruined cities'[53] seem to connect **vēḷ*

with the Proto-Indian Civilization. The most important piece of linguistic evidence is however provided by the word *vēḷ* itself, which stands for 'chieftain' (DED. 4562) as well as 'to sacrifice' (DED. 4561). It will be remembered that Sukra (Venus; *veḷḷi* in Ta.; DED. 4524) was the *guru* (priest) of the Asuras. I interpret the linguistic evidence as indicating that the vēḷir were the priest-rulers of the Proto-Indian Civilization.

2.25. While the Finnish scholars have identified as Venus and as Saturn, my investigations seem to show that the suggested identifications should be exchanged.

The Symbol :

2.26. The Finnish identification is based on their view that the sign is a ligature of with . This does not seem to be correct. The variant forms cited by them seem to be rather cursively drawn variants of an altogether different sign, *viz.*, .

2.27. According to me, the modification consists of two upper strokes on either side of the 'fish' symbol. Hunter has copied a variant showing that the two strokes probably represent horns.[54] In all the 'modified fish' signs, only the modifying elements are phonetically significant. The addition of the horns may indicate *mā* (DED. 3917): animal. Probably a 'horned beast' was originally meant, (e.g.) *māṉ* (Ta.): deer, beast. Also see *māy* (DED. 3779): sharp, sharpen, to grow sharp. Ta. Lex. gives 'nail' as one of the meanings of *mā*. Saturn was known as '*mai-mīṉ*', the 'dark' planet (Ta. Lex.); *mā*, *mai*: dark, black (DED. 3918, 3927).

2.28. What does *mā* mean in this context? It is clearly a title affixed to personal names. I do not, however, think it means 'great'. In spite of the weighty authority of the D.E.D. (3923), I would suggest that *mā*, in the sense of 'great' is really derived from Skt., *mahā*. **mā* in these names is not an attribute as it is sometimes found suffixed; *mā* appears to be present in names like

vēṇmā-ṉ, *vēṇmā-ḷ*, *mā-l*, *mā-k-kaḷ* etc., with the pronominal/nominal suffixes *-aṉ*, *-aḷ*, *-al*, *-kaḷ* after them. While it is grammatically possible to derive *māṉ* from *makaṉ*: 'son,' it noteworthy that the suffix is almost always used with Vēḷir and Chēra names. I suggest that the term *mā* means, 'chieftain, noble or official'. This meaning can be clearly gathered from words like *kāviti-mākkaḷ* (ministers), *kōyil-mākkaḷ* (palace or temple officials) etc. A probable explanation of the term is that the chieftains wore a headgear of horns as shown on some seals and as still practised by some Dravidian tribes. *mā* is used in old Tamil works to describe a man 'in the shape of an animal' (*Puṟam.*, 28).

The Symbol :

2.29. This 'fish' symbol is modified by a mark which seems to represent the eaves of a roof, as pointed out by the Finnish team. We may compare *vaḷavi* (DED. 4346): sloping roof, eaves; *vaḷavu* (DED. 4349): arch, vault; *veḷumpu* (DED. 4463): edge—all derived from **vaḷ-ay*: to bend (DED. 4349). The modifying element may also be regarded as the conventional representation of the sky ('vault of heavens') on the basis of Sumerian and Egyptian analogies (Hunter, p. 203). This will furnish the homophones, *viṇ* (DED. 4422): sky; *veṇ-*, *veḷ-* (DED. 4524): bright (as sky), Venus, as the 'shining' planet. The corresponding O.Ta. names are *vēḷ*, *veḷi*, *vaḷavaṉ* etc.

2.30. As mentioned earlier, the dual meanings of *vēḷ*, 'chieftain' (DED. 4562) and 'to sacrifice' (DED. 4561) constitute important linguistic evidence for the presence of priest-rulers in early Dravidian society. The word *vēḷ*: 'to sacrifice' (DED. 4561) is connected with the root *vēl/ṇṭ*: 'to desire, pray, wish' (DED. 4548).

The Symbols and :

2.31. These two 'fish' signs behave exactly alike. However, unlike the pair , they seldom occur together. The Finnish

interpretation of the signs as Jupiter and Mercury is not acceptable as there are no ancient Dravidian names associated with the two planets. We can, however, make a reasonable guess about the identity of these two planetary signs by a process of elimination. The sun and the moon are unlikely to be represented by the fish symbols; Venus and Saturn have already been accounted for; Jupiter and Mercury have no Dravidian parallels in name-formations; Mars is unlikely because we have a closely related pair here. Thus the ascending and the descending nodes, the shadow or serpent planets, (Skt., *rāhu* and *ketu*) are the only possibilities. The inference is strengthened by the graphic modifications and is almost conclusively confirmed by parallels in Dravidian names.

The Symbol :

2.32. This 'fish' symbol is modified by a vertical stroke, which suggests:

(i) *ō(-ṇku)* (DED. 870): to ascend;

(ii) *sō-* (DED. 2344): to come out, emerge (as sun and moon);

(iii) *cō(ṅ)ku* (DED. 2346): devil, demon, evil spirits;

(iv) *sō-, ōccu* (DED. 2351): to drive away, cause to go by beating;

(v) *ōccan* (DED. 874): priest.

2.33. While there seems to be no surviving Dravidian word for the ascending node, the collection of etyma made above provides enough evidence to suggest **cō-* as a possibility. The term also seems to have acquired the meaning of liberation from the evil influences of the serpent-planet. In the light of this evidence, the derivation of *ōccaṉ*, priest, from IA., *ojhā* (DED. 874) requires reconsideration.

The Symbol

2.34. This 'fish symbol shows a slanting (not horizontal) stroke which immediately suggests: *cāy* (DED. 2026): to incline, decline, as a heavenly body; slope, slant, declivity; *cāy* (DED. 2028): to release, cause to leave. The term *cāy-kōḷ*: descending node, seems to have been assimilated later to Skt., *chāyā-graha*. It should be noted that as with **cō-*, the term *cāy* also seems to indicate both the shadow-planet and liberation from its influence.

2.35. The Dravidian tradition regarding the shadow-planets or the serpentine demons, *rāhu* and *ketu*, is very ancient. The eclipses are caused by the serpents swallowing the sun and the moon. Both the nodes are associated with evil spirits and diseases and regarded as ill-omens. The liberation of the sun and the moon from the serpents is greeted with ceremonial bathing in sacred waters. It appears probable that the Great Bath at Mohenjodaro was connected with ritualistic bathing during eclipses. It is also probable that the Proto-Indian priest knew how to calculate the occurrence of the eclipses, and he would have been less than human if he had not used this knowledge to create awe and respect for himself. Since the priestly rituals appeared to liberate the sun and the moon from the evil influence of the serpent-planets, the ability of the priests to exorcise the evil spirits on earth (probably identified with *rāhu* and *ketu*) would have been obvious to the Proto-Indians. This seems to account for the strange fact that the Proto-Indian priests named themselves after the serpent-planets. The names probably indicate that the priests were also the exorcists. The unbroken continuity of Indian beliefs and rituals built around the eclipses and the peculiarly South Indian (Dravidian) taboos connected with the inauspicious *rāhu-kālam* provide strong evidence that the suggestions made here are not mere speculations.

2.36. It now appears that the Vēḷir known to us from the old Tamil works had names probably derived from the ascending and the descending nodes. The suggested identifications are :

**cō>ō, ōy, ōviyar* (*Puṟam.*, 176, 376 ; *Ciṟupāṇ.*, 122).

**cāy>ā-ay, āy, āvi, āviyar* (*Akam.*, 69; *Puṟam.*, 129, 147).

2.37. The Ōy clan lived in Ōymā-nāṭu, the territory included in modern South Arcot district.[55] Tradition connects this Ōy clan with the Nāga (serpent) race. The connection between **cō* and Ō-y might have remained conjectural but for the lucky survival in the old Tamil poems of the name *Cō-paṭṭiṉam*, the port in Ōymā-nāṭu (the *sōpatma* of the *Periplus*, the modern Markāṇam).

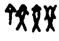
2.38. The Āys appear to have been a more numerous clan judged from the references to them in Tamil literature.[56] (It is interesting that even in the Proto-Indian seal texts, out-numbers by almost two to one). The Āys occupied the Southern-most end of the Tamil country included in modern South Kerala and Tirunelvali districts (the ancient Vēṇ-nāṭu and Nāñcil-nāṭu). We learn from the Āykuḍi copper-plates (T.A.S., I, 12) that the Āys claimed to belong to *vṛṣṇikula*. This connects the Vēḷir with the Yādavas. The Āys are also associated with the Nāga (serpent) race. The phrase *cāy(-a) vēḷir* occurring in the old Tamil *nikaṇṭus* confirms the identification **cāy>Āy*.

2.39. The evidence does not end there. Mention was made of the connection of the Āy and the Ōy clans with the Nāga race. The most common title of the Vēḷir Chieftains was *ara(i)yar*. It has been considered that this word is derived from Skt. *rājan* (DED. 167). What makes this etymology suspect is that, in the Tamil tradition, the honorific *ara(i)yar* is not applied to the kings but only to the Vēḷir nobles, chieftains and officials. A precious clue is the survival of the form *tara(i)yaṉ* as an alernant to *ara(i)yaṉ* (e.g.) Villa-v-ara(i)yaṉ and Villa-tara(i)yaṉ ; Viṟup-p-araiyaṉ and Viṟuppa-tara(i)yaṉ, Mut-tara(i)yar etc. The etymology of *taraiyar* as those who rule the land (*tarai*) is unconvincing. The alternation between *ara-y-* and *tara-y-* is strong linguistic evidence for an original **cara-y* which means ‘serpent’. Compare *ara* (Ta.), *saras* (Ko.), *taras* (Go.) etc., for ‘serpent’ (DED. 1949). I would,

therefore, suggest that the Vēḷir, whose clans bore the names of the two serpent-planets, called themselves **cara-y>tara-y/ara-y-(ar)*. The Tiraiyar who lived in the northern districts of the Tamil country in the ancient times seem to be connected with this name (**tara>*tera->tira-*).[57] I also suggest that this is the true origin of the name *aravar* (DED. 264) for the Tamils, lit., the people of the serpent (clans).

2.40. The ancient Dravidian custom of serpent-worship was in origin probably the worship of the serpent-planets. The entwined serpents carved on stones found under the pipal trees in almost every South Indian village probably represent the twin serpent-planets. The association of Siva, Viṣṇu and Kṛṣṇa with serpents may also have the same origin. The legends of the five-headed and the seven-headed serpents are probably connected with the well-known five or seven clans of the Vēḷir.

2.41. The astonishingly close parallels between the clusters of the 'fish' symbols occurring on the Proto-Indian seal-texts and the composite names and titles borne by the Dravidian Vēḷir is brought out in the examples given below. It is necessary to emphasise that the blocks of 'fish' symbols and the Dravidian names are taken from *actual* occurrences :

'Fish Blocks'	Prob. phonetic values	O.Ta. Parallels
	mi(ī)ḷ/ṇ/t-ey	*mīḷi, miḷai, ve(ē)ḷ-i* (Skt., *mleccha*)
	mi(ī)ḷ/ṇ/ṭ-anṟ	*minṭ-aṉ, miṭuk-k-aṉ, miṭ-al*
	mā ve(ē)ḷ/ṇ	*mā vēḷ*
	ve(ē)ḷ/ṇ mā	*vēṇ mā(-ṉ), veḷi mā(-ṉ)*
	*mā ve(ē)ḷ/ṇ cāy ey*	*mā vēḷ āy evvi*
	cāy ve(ē)ḷ[ṇ]	*āy vēḷ*
	cāy anṟ	*āy-aṉ ; āy āṇṭira-(ṉ)*
	cō ey	*ō-y*

The parallels are so close and so numerous that they constitute the best evidence of the essential correctness of the interpretation proposed here.

The Symbols , , :

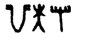
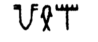
2.42. A comparison of the pair of the ' modified fish ' symbols and with the corresponding pair and is instructive. These are obviously linked by the use of similar ' modifying ' elements. From this we can infer that the unmarked symbols and are similarly related. The pictograms clearly suggest the idea of a combination. We may, therefore, interpret the symbols as representing the collective entity of a clan or tribe. Then and represent the clans of the ascending and the descending nodes respectively while and represent the individual members of the two clans. The pictogram can be interpreted through the homophones,

(1) *kūṭu* : to come together, join, meet, combine (DED. 1562)

(2) *kūṭṭam, kūṭṭar* : clan or tribe: members of a clan or tribe (ibid., Ta. Lex.)

The term *kūṭṭam* is used even today as the specific technical term to connote the totemistic clans among the Vēḷāḷalar of the Tamil country.

The Symbol :

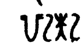
2.43. It is convenient to deal with this symbol is this section because of its close functional similarity to . Compare the blocks  and  . Hunter's identification of the symbol with a ' horned man ' representing a hero or god offers the best explanation.[58] The Soviet scholars regard some of the variants of the symbol as ' a horned personage ' and others as ' a female personage with uplifted hands and large breasts '.[59] However, the analysis of the sequences proves that all the variants constitute a single symbol, as pointed out by Hunter and the Finnish team.[60]

The Finnish interpretation of the symbol as a 'star' takes no account of the pictorial representation and cannot, therefore, be accepted.[41] According to my interpretation, the symbol is a title or name as it alternates with the symbol . It represents a male name as it is followed almost invariably by the masculine singular suffix.

2.44. The etyma grouped in DED. 986 offer good possibilities; *kaṇṭaṉ* (Ta.) : warrior ; *gaṇḍ* (Ko.) : male ; *gaṇḍa* (Ka.) : a strong, manly, male person ; *gaṇḍu* (Tu.) : male, valiant, etc. The root **ka*(*ṇ*)*ṭ*- is particularly found in words describing horned male beasts. See *kaṭamā* and other entries in DED. 935 for bison, stag, antelope, etc., and also *kaṭavu* (Ta.) : male of bull, buffalo, ram, etc. (DED. 943).

2.45. A parallel is found in the use of *kaṇṭaṉ* as a favourite title by the Vēḷir and the Chōḷas: The Vēḷāḷar of the Tamil country (the descendants of the Vēḷir) have retained the honorific till this day in their names ; *c.f.*, *kaṇṭar*, *kavuṇṭaṉ* and '*gouṇḍer*' (the last two from Ka. *gauḍa*<*gaṇḍa*). We can, therefore, regard the digramme as corresponding to **ka*(*ṇ*)*ṭ-anṟ* (O.Ta. *kaṇṭaṉ* : male person of status).

The 'enclosures' to :

2.46. This symbol is frequently enclosed between two sinuous or curved lines like this : , , . The lines appear to represent serpents as suggested by the first variant given above. I have already suggested the derivation of *ara*(*i*)*yaṉ*, the most common Vēḷir title from **cara-y*, serpent (DED. 1949). It is, therefore, possible to equate the block  with **cara-y-kaṇṭ-anṟ* (O.Ta. *ara*(*i*)*y* [-*aṉ*] *kaṇṭ-aṉ*).

The Symbol :

2.47. This symbol functions as a prefixed attribute, mostly before and . Its position and obvious resemblance to the Sumerian pictogram *lugal* (' great ') make it likely that it is an attri-

bute. This is also confirmed by the determination of the values of and as titles or honorifics. However, the symbol is one of the very few symbols in the script which cannot stand by itself, as noted by Hunter.[62] It is, therefore, likely to be a true adjective, not a noun functioning as an attribute. Heras proposed the value *per* (-*u*) 'great' and the suggestion has recently been revived by Gurov.[63] The identification, however, is not supported by any argument based on homonymy. The Finnish suggestion that the pictogram , represents the concept 'straight, just' with the phonetic value corresponding to Ta. *ce-m* (also meaning 'red') is an improvement, though their identification of the pictogram as a flower (Ixora) fails to carry conviction.[64]

2.48. It is almost certain that the pictogram represents a weapon, somewhat like the later trident, with a toothed head mounted on a long shaft or staff. In accordance with the method of parallels, we have to look for a word in Old Tamil which represents a weapon and was widely used as a prefixed attribute.

The following homophones seem to be apt :

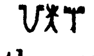
(1) *neṭṭai* : a kind of weapon. (Ta. Lex. citing *Patiṟ*., 42, 3, commentary). The description of the weapon in the pictogram as 'long or tall' seems to fit in.

(2) *neṭu-* : (*a*) tall, great (DED. 3099).

(*b*) a common attribute to kings and deities in Old Tamil (e.g.) *neṭu māl* : Viṣṇu ; *neṭiyōṉ* : Viṣṇu or Murukaṉ ; *neṭu vēḷ*: ibid ;

Neṭu-ñ-cēral-ātaṉ, Neṭu-ṅ-kiḷḷi, Netu-ñ-ceḻiyaṉ : examples of kings' names with the attribute '*neṭu*' : 'great'.

2.49. The following parallels are particularly interesting :

 : **neṭ-(v) ka(ṇ)ṭ-(v) anṟ* : (cf. O.Ta. *Neṭuṅ-kaṇṇaṉ* : the name of a Pāṇḍya, (*Akam*., 373). Here, as also in

Ceṅkaṇaṉ, the name is related to *kaṇṭaṉ* or *kaṇa-(v)-aṉ* and not to be derived from *kaṇ*, eye.

: **neṭ-(v) miḷ/ṇ/ṭ ey.*, cf. O.Ta. *neṭu miṭ-al* (*Akam.*, 266) : a personal name ; *neṭu-vēḷ* : ' A great Vēḷ ' ; also a deity (Viṣṇu or Murukaṉ).

- : **neṭ-(v) mā-* : O.Ta. *neṭumā-l*: Viṣṇu ; *neṭumā-ṉ* : a king's name or title.

The Vēḷir are described as the descendants of *neṭiyōṉ* or *neṭu-muṭi-aṇṇal* (Nacc., on *Tol.*, *Pāyiram* and *Poruḷ.*, 34) who is considered to be Viṣṇu-Kṛṣṇa. The terms used by the commentator seem to be astonishing survivals of Proto-Indian usage. In the light of the decipherment, we can consider **neṭu-mā-* etc., to be the Priest-King of the Vēḷir, whose apotheosis resulted in the later Viṣṇu-Kṛṣṇa cult. It is ' Proto-Viṣṇu ' and not ' Proto-Siva ', who seems to be the presiding deity of the Proto-Indian civilization.

The Symbol :

2.50. The pictogram has been interpreted by the Soviet scholars as a personage carrying a club on his shoulders.[65] Volcok has expressed the view that the symbol probably represents a deity which could be regarded as one of the predecessors of Vedic Yama, since Yama has the constant epithet *daṇḍin* or *daṇḍadhara* in Sanskrit,—' one who carries a club '.[66] The Finnish team has drawn attention to the realistic portrayal of the symbol on an ivory plaque (which shows a personage with a crown, carrying a club over his shoulders) and has drawn the inference that the symbol means ' great '.[67]

2.51. According to the morphology of the script, anthropomorphous signs refer to human beings. Hence the symbol can be regarded as a person of high authority or status. The key to the recognition of the meaning and the phonetic value of the symbol lies in the special element, *viz.*, the staff carried on the shoulder, which distinguishes the sign from the other anthropo-

morphous symbols. The identification of the special element as a bamboo rod or staff connects it with the following homophones:

(1) *vēy* (Ta.): bamboo, bamboo rod (DED. 4559; Ta. Lex.); *vetir* (Ta.), *veduru* (Te.): ibid., (DED. 4514); *mētar*, *mētaravar*, *mētavar* : A class of people who do bamboo work (Ta. Lex.); (*v*>*m*).

(2) *vēntaṉ* (Ta.): 'king' (DED. 4549); *vēttiya-* (in cpds.): 'of kings' (Ta. Lex.).

(3) *vēy-ar* : a class of brahman priests; *vētiyar* : brahmans, priests; (Ta. Lex.).

2.52. According to Indian tradition, both the king and the priest carry a staff representing royal or religious authority. It is, however, more likely that the Tamil word *vēntaṉ* (DED. 4549) is really derived from *vēy*, to cover or thatch (DED. 4552), and signifies a 'crowned' personage, as pointed out by N. Subrahmanyan (PPTI, p. 791). According to the old Tamil tradition only the *vēntar* (kings) were entitled to wear the crown and not the *vēḷir* (chieftains). The sign is, therefore, not a direct ideogram, but a phonogram based on the homophony between **vē-y/t* : bamboo staff and **vēy-nt* : a crowned personage.

2.53. The linguistic connection between *vēnta-* : 'king' and *vētiya-* : 'priest', has not been so far recognised, no doubt due to the Indo-Āryan tradition of the separation of the functions of the king and the priest, the latter being represented by the brahman in later Hinduism. The apparent resemblance between Skt. *veda* and Ta. *vētiya* has further masked the true etymology of the word. According to my interpretation, **vē-y/(n)t-(v)* (>*vēntaṉ*, *vē(t)tiyaṉ*) represents the King or the High Priest, or rather, the Priest-King, even as **vēḷ/ṇ* signifies both a chieftain and a priest. These two words form the most important linguistic evidence that in the Pre-Āryan Dravidian society, the functions of the priests and the rulers were performed by the same persons. This clearly takes us

to the age of the Proto-Indian polity and to the analogies of the priest-kings in the contemporary West Asian civilizations.

2.54. We have direct evidence in the so-called 'Paśupati' seal regarding the type of 'crown' worn by the Proto-Indian dignitaries. The 'crown' consisted of a headgear made from buffalo-horns. The tradition is still maintained by many tribal societies and finds it echo in Ta. *kompaṉ* (lit., the horned person): a great or clever man. The recognition of the likely meaning of **vẹ̄-y/(n)t* as a personage crowned with buffalo horns and the possibility of alternation between *v/m* (see the Ta. 'bamboo-worker' words quoted above) suggest an interesting parallel:

> *mēti*, *mētiyaṉ*: buffalo; a buffalo-faced demon slain by Durgā; Yama (riding on a buffalo). (Ta. Lex.).

Here we seem to have a link with Mahiṣāsura, the buffalo-faced demon whose destruction probably signified the victory of the Aryans over the Dravidians; *mēti* (*mahiṣā sura=yama*) represents the buffalo-horned Proto-Indian High-Priest or the Priest-King, who is depicted on the 'Paśupati'-type seals.

2.55. It is astonishing that the *vēntar-vēḷir* group of the old Tamil civilization should also occur in the Proto-Indian polity, though, of course, in a very different social milieu. The digramme **mŭ-vēy-/(n)t* offers an interesting comparison with Old Tamil *mū-vēnt-ar*, the three 'crowned' kings. However, I regard the constant prefix as an attribute, **mu-(nṟ-)*: 'chief' (DED. 4119) or **mu-(nt-)*: 'senior, great' (DED. 4053, 4057). The expression **mŭ-vēy/(n)t-*, can thus be interpreted as 'the Great Priest-King'.

3. THE ACROPOLIS AND THE LOWER CITY

The Symbols , *and* :

3.1. These three symbols form a notable set graphically and functionally. Their most marked characteristic is their introductory position in the inscriptions. They commence the texts in

about 15 per cent of the inscriptions. They are generally accompanied by one of the three 'strokes': ״ , · or ˈ . They constitute independent blocks along with the strokes. The sequences following them can be shown to be separate words, most probably representing names or titles. In particular, the functions of ⊗ and ◇ appear to be very similar. They both act as introductory symbols largely before the 'fish' blocks and the series formed by the symbols ☨ or ᛘ with the 'numeral' signs. The proportion of ◇ to ⊗ in the initial position is 2 : 1. The symbol ◈ occurs with much less frequency in comparison with the other two symbols. The symbols ◇ and ◈ occur in linear or circular forms which are seen to be mere graphic variants from the sequences.

3.2. Hunter suggested that ⊗ and ◇ are probably deities and that the appended strokes function as the dative suffix.[68] Heras regarded ⊗ as the sun in the literal sense.[69] He considered the linear and circular forms of the other two symbols as distinct symbols and generally interpreted them as place-names.[70] He suggested that the stroke · stood for the locative-ending after the place-names [71] The Finnish team has identified the pictograms ⊗ , ◇ and ◈ as depicting the (potter's) wheel, the conch and the plan of a city respectively.[72] They interpret all these symbols as divine epithets or royal titles. The strokes appended to the symbols are identified as pronominal suffixes.[73] The phonetic equations suggested by the Finnish team are, however, linguistically unsatisfactory.

3.3. In order to ascertain the probable functional character of the 'introductory' symbols, I turned to the Dravidian name-lists to identify any predominant element in the initial position. It proves to be decisively the place-name. Out of the 98 composite personal names in the Tamil-Brāhmī inscriptions, 25 begin with place-names. The alphabetical list of the 'Sangam' poets has 473 names, out of which 184 (39 per cent) commence with place-names. We may, therefore, assume as a working hypothesis that the three 'introductory' symbols represent place-names.

3.4. **This supposition receives strong support from the appearance of the stroke most frequently appended to the 'introductory' symbols. It appears possible to determine its value through the homophones, **ir-* : 'two' (DED. 401) and **ir-* : 'to be in a place, to reside' (DED. 407). In Old Tamil, the locative suffix also acts as the possessive suffix and is frequently used to indicate the residence of a person in a place or his belonging to a group of persons. This explains well the behaviour of the stroke which seems to follow place-names and personal names. The following examples will bring out the dual function of *-il*, the locative-possessive suffix :**

(i) *añci-l añci-y-ār* : Añci of (lit., in) the house (of) Añci (author of *Naṟ.*, 90).

(ii) *Rājarāja-t-terinta valaṅkai vēḷai-k-kārar-il varakuṇaṉ cīrāḷaṉ-u-kku-p-paṅku mukkālum* : Three-fourth share to Varakuṇaṉ Cīrāḷaṉ of (lit., in or among) the Rāja-raja-t-terinta valaṅkai vēḷai-k-kārar (a regiment of king's bodyguards). (S.I.I., II, 66).

3.5. The other two strokes, and , also have precisely the same functions and must, therefore, be locative or possessive suffixes. They appear to be conventional and their phonetic value cannot be fixed by homonymy. This problem can, however, be tackled by the method of parallels. Inscriptional and literary evidence in Old Tamil attests to the use of only three suffixes in this environment, *viz.*, the attributive-possessive ending *-a*, the locative-possessive suffix *-il/ṉ* and the locative-possessive oblique case ending *-t-*. The stroke has been identified with **-ir* (=*il*, *iṉ*). One of the other two must therefore correspond to *-a* and the other to *-t-*. A clue is provided by the fact that while can be followed by , the other two members of the set cannot be. As we shall see presently, appears to end with a long vowel and the other two with consonants (ignoring the enunciatory vowels). On this basis, I propose the equations =**-a* and =**-t-*.

3.6. The next point for determination is the type of place-names one is likely to come across in the seal-texts. The obvious possibility that each 'introductory' symbol represents one city is ruled out as the proportion of the occurrences of these symbols is approximately the same on the seals recovered from various sites. We are, therefore, left with the possibility that these symbols stand for places or institutions which existed in every Proto-Indian city.

3.7. It turns out that the symbols , and appear to represent respectively the Temple, the Citadel (Acropolis) and the City and indicate the place of residence as well as the status of the seal-holders.

The Symbol :

3.8. It is difficult to accept the Finnish identification of the pictogram as a wheel, as there is no evidence that the Proto-Indians knew the spoked wheel. A comparison with Babylonian sculptures seems to indicate that the symbol may be a conventional representation of the sun. An important piece of internal evidence is the symbol which clearly shows the sky above the orb and shadows cast below. (I have provisionally identified this symbol as the moon or the night).

3.9. The identification of as the sun suggests the following homophones :

(1) *vē-* (DED. 4540) : To be hot (as the sun) (e.g.) *veyyōṉ* : sun ; *veyyil* : sunlight, heat of sun.

(2) **vē-* (DED. 4550, 3635) : god, demon, spirit. (e.g.) *vē(n)did, vē(n)diḍ* (Pa.), *vē(n)diṭ* (Ga.), *vēnu* (pl. *vēnga*) (Kui.), *pēn* (Go.), *pēnu*(Kui), *pēy* (Ta.), *pē-* (Ka.), *pēyi* (Tu.) : god, demon.

We can deduce that **vē(-ṅk)* was used as a place-name from later Dravidian evidence. Vēngi occurs as the name of the country of the Eastern Chālukyas and of the capital city of the Sālaṅkāyanas. *Vēnkai*, tiger, became the emblem of the Chōḷas, probably because

the name of the animal is homophonous with *vē-ṅk. We can recognize two Dravidian words *vē- (deity) and *ka(ṇ)ṭ-a (Lord) in the name of *Vēṅkaṭa*, the Lord of the Seven Hills. The name of the rivers *Vaikai* and *Vēga(-vati)* (<**Vēkai*) flowing through Madurai and Kanchipuram respectively seem to be connected with *vē-(ṅ)k. One of the eighteen gaṇas who accompanied the Vēḷir to the south was known as *vēṉ-il-āḷar*. We may thus interpret the symbol , *vē-(-ṅk-/nt), as meaning 'in the temple,' 'of the temple' or 'among the personsin the temple' or 'belonging to the Deity' (when followed by a suffix).

3.10. The archæological evidence on the existence of the temples in the cities is meagre. However, there is adequate evidence from the general character of the civilization to warrant the presumption of the existence of a Temple as the central focus of civic-religious life. Sumerian and later Dravidian parallels of temple-cities also support the idea.

The Symbol ◇ :

3.11. The Finnish identification of the pictogram as a conch by the collation of variants is a piece of brilliant deduction. This forms the basis of the phonetic correspondences proposed by me :

(1) **cur-*, **cūṛ-*, **cuṟ-* (DED. 2211, 2223, 2238 respectively) : to be curved or spiralled (as the conch) ; e.g., *curi-mukam* : conch ; *cōṛi* : 'cowry' ;

(2) **cūṛ-*, **cuṟ-* (DED. 2223, 2238) : to surround, surrounding place or persons.

Consider the following examples :

(i) *cūṛ-al* : place, locality (Ta. Lex.).

(ii) *cūṛ-aka-(irukkai)* : fortified capital (Ibid.).

(iii) *cūṛ-v-ōr* : counsellors, ministers (Ibid.).

(iv) *uṛi, uṛai* : place, site, esp. about a king (DED. 588).

(v) *uṟai-y-ar, uṟai-y-avar uṟai-y-iruntār* } king's counsellors, attendants; those who live in *uṟai*. (Ta. Lex.).

(vi) *ūṟi-y-ar* : servants or attendants at temples or palaces (DED. 646 : but this appears related to 2223).

(vii) *cuṟṟam* : attendants esp. of a king (DED. 2238).

(viii) *kuṟu* : assembly (DED. 1513) ; acc. to O.Ta. usage the term is used for assemblies or committees constituted by or under royal authority; cf. *aim-peruṅ-kuṟu*.

The collected etyma show the initial consonant *c>k*, *t* or *Ø* and the final consonant alternating between *r*, *ṟ* and *ṟ*. The phonetic equation for the Symbol can be written in the conventional form **cur/ṟ/ṟ-(v)*; (*c=k*, *t* or *Ø*)

3.12. Here we have, almost certainly, the term for the Citadel or Acropolis that is such a characteristic feature of the Proto-Indian cities. "Harappan uniformity begins with the basic conception of the city plan. At Harappa, Mohenjodaro and Kalibangan, this consists of two distinct elements: on the west a 'Citadel' mound built on a high podium of mud-brick, with the long axis running north-south, and to the east, apparently broadly centred upon the Citadel, a 'lower city' consisting of what must have been the main residential areas" (Allchin, 1968, p. 238). The Citadel was without doubt the Acropolis, the centre of religious and secular authority. This is amply borne out by the public character of the buildings on the Citadel at Mohenjodaro, the Great Bath, the Collegiate Building, the Pillared Hall and the Granary. "The general indication of a combined kingly and priestly rule fits the habit of the Third Millennium" (Wheeler, 1966, p. 18). The parallel with the Dravidian civilization portrayed in old Tamil poems and inscriptions is no less striking. Terms like *aka-nakar* (*Maṇi.*, 1-72) and *aka-nilai* (*Cilap.*, V : 161) for the 'inner city' and *Puṟa-k-kuṭi* (Mani., XXVIII : 4), *Puṟa-nilai* (Cilap., V : 180) for 'outer town' preserved in old Tamil works indicate the

existence of a city-plan very similar to the Proto-Indian type. Thousands of temple inscriptions, particularly of the imperial Chōḷas, enumerate numerous temple and palace attendants. We shall see later that many of the symbols of the seal texts can be interpreted on the basis of these parallels. The block can, therefore, be interpreted to mean ' in the Citadel ' or ' of the Attendants '.

The Symbol :

3.13. The pictogram has been universally interpreted as the plan of a city. The walls of the city and the streets intersecting at right angles are unmistakable. There are several Dravidian words for a city. However, in accordance with the method of parallels, we should find a word which was in ancient use and which specifically connotes the idea of a *planned* city.

The selected homophones are :

(1) *pāṟi* (Ka.) : row, line, regularity (DED. 3384).

(2) *pāṟi* (Ta.) : town, city, temple (DED. 3383).

(3) *pāṭi* (Ta.) : (*a*) military encampment (prob. because of the planned row of tents).

(*b*) town, city (DED. 3347).

3.14. The word *pāṟi* in old Tamil literature is specifically associated with the Vēḷir cities. Āy and Miñili fought a battle at Pāṟi (*Akam.*, 208). The name of the city of Naṉṉaṉ Utiyaṉ was Pāṟi (*Akam.*, 15). *Toṉ-mutu-vēḷir* (a term generally used to denote the remote ancestors of the Vēḷir, probably before their southern migration) stored gold at Pāṟi (*Akam.*, 375). The city of Pāṟi had a ' red ' fort and its walls shone like copper (*Akam.*, 375). This description closely resembles that of the legendary ' three forts ' (*Tiripuram*) destroyed by Siva. These parallels provide strong evidence that the Dravidian name for the Proto-Indian cities was approximately **pāṟ/ṉ/ṭ(-v)*.

3.15. The symbol represents the 'lower' city where the commoners like artisans, agriculturists and traders must have lived. This provides a satisfactory explanation for the paucity of this symbol on the seals which mostly belonged to the ruling classes living on the Acropolis. This also explains the nearly identical use of and , as the persons 'in the Citadel', and 'of the Temple' must have been from the same group. There are also instances of priests in the lower city or commoners in the Acropolis, no doubt to perform specific civic or religious functions.

3.16. The decipherment of the 'introductory' symbols confirms what the archaeologists have suspected ever since the cities were excavated, *viz.*, the fundamental division of the Proto-Indian society into the priest-rulers of the citadel and the common people of the lower city. The decipherment has also brought out two astonishing historical parallels set out below :

First Parallel :

**cur/ṛ/ṟ-(v)*	*Cōṛa, Cōḍa, Cōḷa, Cuṭu, Tuḷu ;*
**pāṛ/(ṇ)ṭ-(v)*	*Pāṇṭiya, Paṛaiya ;*

Second Parallel :

**cur/ṛ/ṟ-(v)*	*Kuru>Kaurava* (*c=k*) ;
**pāṛ/(ṇ)ṭ-(v)*	*Pāṇḍu>Pāṇḍava.*

3.17. I interpret the linguistic evidence thus :

The First Parallel: The people of the Citadel, the Priests and the Attendants, correspond to the Vēḷir of Tamil history. It will be shown presently (section 5) that the people of the lower city correspond to the Kōcar (lit., mountain people) of the Tamil country. After the collapse of the Proto-Indian civilization, the Vēḷir and the Kōcar migrated to the South maintaining their separate identity. There is evidence to show that the route of their southern migration

lay through the Indo-gangetic plains, Gujarat, the coast of Konkan and the Tuḷu territory into the Tamil country. Early Tamil history can be re-interpreted as virtually a battle for supremacy between the Vēḷir and the Kōcar. The Vēḷir occupied most of the fertile plains on the eastern and western coasts and built up the powerful Chōḷa and Chēra empires which were really grand confederacies of the Vēḷir Chieftains. The Kōcar, true to their origin as the hill people, occupied the central highlands included in the Kongu and the Pāṇḍya territories and built up the Pāṇḍya Kingdom. The traditional division of the old Tamil rulers into the three *Vēntar* (kings) and the many *Vēḷir* (chieftains) has obscured the fact that the original and fundamental division was between the Vēḷir (including the Chōḷas and the Chēras) and the Kōcar (including the Pāṇḍyas). The bitter Chōḷa-Pāṇḍya wars lasting for centuries in the Tamil country were the final echoes of the conflict between the ruling citadel-dwellers and the oppressed city-dwellers of the Proto-Indian civilization. The only memories of the earlier epoch were, however, the vaguely remembered legends about the earlier 'Sangam' Ages, the sacerdotal origins of the Vēḷir and the 'fish' flag of the Pāṇḍyas, the symbol of their erstwhile servitude under the 'fish' people. (*Vide* Excursus A on the history of the Vēḷir and Excursus B on the history of the Kōcar).

The Second Parallel: The Kurus seem to be connected with the ruling classes of the Citadel and the Pāṇḍus with the common people of the Lower City. The serpent-flag of Duryōdhana, the leader of the Kurus, should probably be traced to the serpent-planets worshipped by the Citadel people. The equation of the Pāṇḍavas with the people of the Lower City receives some support from the fact that both the groups appear to have been mountain-people in origin (*See* Section, 5). The Great Bhārata War can be seen in this light as the struggle between the ruling classes and the rebellious commoners of the Proto-Indian polity. The victory of the Pāṇḍavas signified the end of the old order and the collapse of the civilization based on it. The Kurus and the Pāṇḍus remaining in the Pāñcāla and the Doab must have become 'Āryanised'

in course of time and the Epic, even in its earliest version, was probably no more than a record of the dim recollections of a distant past,—in fact the Northern equivalent of the Tamil legends of the earlier 'Sangam' Ages, based on similar racial memories of vaguely remembered events. Both the great traditions converge on the cities of the Proto-Indian civilization. It is here that we reach the bedrock of unity of the Indian peoples.

4. THE INSTITUTIONS ON THE ACROPOLIS

4.1. In an earlier section we considered the symbols relating to the High-Priest and the priests. We shall now deal with the other two categories found associated with the Citadel:

(*a*) High officials or nobles (also from the priestly classes) in charge of institutions;

(*b*) Temple or Palace attendants and guards.

The Symbol :

4.2. Heras identified the symbol as a crab and interpreted it as the name of a city and its people.[74] The identification is incorrect as the crab is represented by an altogether different symbol. The Finnish identification of the symbol as a two-sided drum with one side open to indicate a single-sided drum fails to carry conviction. They interpret the symbol as a priest; but their choice of the word *tampala* (?) is linguistically unsatisfactory.[75]

4.3. The key to an understanding of the symbol is to realise that it is lying 'on its side', and should be turned through 90° to get the correct orientation. This is a normal feature of many signs of the script, as demonstrated by the 'bird' signs with their legs in the air. The correctly oriented pictogram immediately tells us what is: the trunk of a body. Notice the waist and the open neck. This leads us to the homophones:

(1) *iṭai* (Ta.), *eḍa* (Ka.): waist, (DED. 380).

(2) *ed* (Ko.), *ede*, *erde* (Ka.), *ede* (Tu.) *eda* (Te.) *edram* (Pa.): trunk, chest, breast (DED. 683).

(3) *iṟai* (Ta.), *eṟe* (Ka.), *eṟa* (Te.): lord, master, chief (DED. 448).

The etyma in (1) look ultimately to *iṭu-ṅk(u)*: to be constricted, narrow (DED. 378). Similarly the etyma in (2) can be derived from *iṟu-k(u)*: to contract, constrict, (DED. 447). We can thus posit the root **iṟ-*, for deriving both the groups through *ṭ* <*ṟ*> *t*. The pictogram may, therefore, suggest the homophone **iṟ(-ay)*: lord.

4.4. Proper names are of course 'untranslatable' though we may etymologise to get at their origin. It is usually more fruitful to establish historical parallels for the names. These are found by comparing the *iṭ*-forms with *iṭai*: a clan name and the *ed*-forms with *yadu*>*yādava* (Skt.): A famous Non-Āryan people having their seat of power at Mathurā and later at Dvārakā. Confer the Tamil-Brāhmī form *Yaḍu* (Arikamedu).[16] The addition of the symbol to all the varieties of the 'fish' signs proves that **iṟ-*(*iṭ-*, *ed-*) served as a general epithet for the priests whom we have already identified with the Vēḷir.

4.5. The decipherment of the symbol confirms the persistent southern tradition connecting the Vēḷir (particularly the Āys) and the Iṭaiyar with the Yādavas. In fact, most of the Dravidian royal dynasties including the Āndhras, the Chalukyas, the Hoysalas and the Yādavas in the Karnāṭaka and the Vēḷir-Chieftains (counting the Chēras and the Chōḷas in the group) in the Tamil country claimed to be Yādavas. The Sanskrit tradition that the Yādavas were a non-Āryan people though held in high esteem is also confirmed. The special relationship of the Yādavas with the Kurus can now be interpreted as due to racial affinity. (*Vide* Excursus A)

The Symbol :

4.6. This is a frequently occurring terminal sign with the functional characteristics of a title or epithet. Its virtual identity with the corresponding Sumerian pictogram *pin*, *apin* (plough) has

been noticed by all the workers in the field. The symbol is of great cultural significance for proving the existence of the plough in the Proto-Indian civilization and the connection between the Sumerian and the Proto-Indian scripts. Both Heras and the Finnish team have regarded the symbol as a honorific epithet, the former proposing the phonetic value *uḻavar* (from *uḻu*, to plough) and the latter, the value *mēṭi* (from *mēḻi*, plough).[77] Neither suggestion is acceptable as there are no Dravidian parallels for such usage.

4.7. A clue to the recognition of the correct phonetic value is furnished by the Sumerian pictogram which actually shows a yoke with the plough.[78] This suggests the homophones :

(1) *cēr* : plough ; plough with yoke (DED. 2313)
(from *cēr* : to be united, DED. 2312).

(2) *cēr* : granary (Ta. Lex.).
(from *cēr* : to be collected, DED. 2312).

Here then we have the word for the great Granaries excavated at Mohenjodaro and Harappa. Since the context indicates a person rather than an institution, the symbol can be interpreted as the Keeper of the Granary, undoubtedly a very important official since the Granaries were the Public Treasury or, in the words of Wheeler, ' the State Bank '.

4.8. There are several parallels for names formed from *cēr* or its inflected forms ending with -(*n*)*t*, -*p*, or -*v*. The most important parallel is furnished by the name *Cēra* (the Chēras), one of the three great Tamil dynasties. There are several corroborative details to substantiate the identification. The Chēras were essentially superior Vēḷir Chieftains and took Vēḷir women in marriage. A part of the Chēra territory was known as *Vēṇāṭu*, the country of the Vēḷir. The area was also known as *nāñcil-nāṭu*, the country of the plough, suggesting that the homophonous emblem of the plough had not been forgotten. The royal emblems of the

Travancore kings, the conch and the wheel (as it was later identified) also seem to have a similar origin. The legend regarding the feeding of the armies of the Bhārata War by an ancestor of the Chēras (*Puṟam*, 2) acquires a new significance from the finding that the **Cēr-a* was in charge of the granaries. Other names and titles in Old Tamil which appear to be connected with **cēr-* are *cē(r)ntaṉ*, *cērppaṉ* and *cērvai*.

4.9. An interesting parallel is provided by the name *Cedi*, which appears to be an inflected form of **cēr*. (cf. *cērd-*, *cēd-*, *cēnt-* forms in DED. 2309 and 2312). According to the Mahābhārata (I, 63), the Cedi kings descended from the Kurus and had non-Āryan names like *Māvēla* and *Yadu*. It is significant that Balarāma, the Yādava prince, had a plough as his weapon (*halāyudha*).

The Symbol :

4.10. This is a common symbol and forms , one of the most frequent combinations in the script. The Finnish team has identified the pictogram as a mortar with pestle.[79] Their later interpretation that the digramme represents a deity is based on their incorrect identification of as the dative sign.[80]

4.11. Excavations have brought to light wooden mortars sunk into the ground and surrounded by brick platforms (S. Piggott, 1950, Pl. 3). The related homophones are :

(1) (*a*) *kuṭṭ-u* : to pound (DED. 1391).

(*b*) *kuṟ-u*, *kuṟṟ-u*, *kutt-u* : to pound as in a mortar (DED. 1536).

(*c*) *kuḍy* : pit-mortar (DED. 1383).

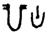
(2) (*a*) *kuṭṭ-am*, *kuṭṭ-ai* : small pond, pool, pit (DED. 1389).

(*b*) *kuṇṭ-am*, *kūnṭ-u* : pond, pit (ibid.).

(*c*) *kuṇḍa* (Skt.) : round hole for water or sacred fire (ibid.).

4.12. The symbol can thus be interpreted as standing for a sacred pool of the type represented by the famous Great Bath at Mohenjodaro. The Great Bath has often been compared with the sacred 'tanks' adjoining the Dravidian temples. The comparison is apt. However, it now appears that the importance attached to the Great Bath or the Sacred Pool by the Proto-Indians was far greater. The legends of the origin of the Vēḷir (including the Chalukyas and the Hoysalas) from a *kuṇṭa*, variously identified with a fire-pit, water-pit or water-pitcher, should now be re-interpreted as referring to the ancient origin of these people from the Place of the Sacred Pool.

4.13. There are three blocks which refer to the Priests specially connected with the Pool. Two of them are digrammes :

 : **kuṭ anṟ* ; cf. O.Ta. *kuṭṭaṉ, kuṭṭuvaṉ*.

: **kuṭ ey* : cf. O.Ta. *kōṭai*.

In later Tamil tradition, both these frequently occur as Chēra names. Also compare *Kuṭṭanāṭu* : the country of lakes, or the country of the Chēras (Ta. Lex.).

4.14. The trigramme connected with the Sacred Pool occurs very often on the seals. The earlier Finnish reading of the first two symbols as *kuṟ muṉ* is essentially correct, though they have not realised its significance.[51] The trigramme in fact stands for 'the Chief (Priest) of the Sacred Pool'. The symbol consisting of the three long strokes suggests the homophones :

(1) **mū̆-nṟ-(u)* : three (DED. 4147).

(2) **mū̆-nṟ-(u)* : superiority, priority, eminence (DED. 4119) (Ta. *muṉi, muṉai*).

(3) *mut-al-* : principal, chief, headman (DED. 4053).

(4) *mut-u* : old, senior (DED. 4057).

4.15. The most frequently recurring block in the texts, produces an astonishing Dravidian parallel:

**kuṟ munṟ ey*: cf. O.Ta. (1) *kuṭa muṉi*
(2) *kuṟu muṉi*: Agastya (Skt.)

Incredible as it may seem, the Chief (Priest) of the Sacred Pool turns out to be none other than Agastya himself! There is adequate evidence to substantiate the identification. According to legend, Agastya was born in a water-pitcher, a story which immediately connects him with the Vēḷir. The word for 'pitcher', *kuṭa-* (DED. 1376) is practically identical with *kuṭṭa-* 'pool', (DED. 1389). The near-identity between *kuṟ-* and *kuṭ-* makes it certain that the story of Agastya's 'dwarfishness' is spurious and caused by the linguistic confusion between *kuṭṭ-* ('pond', DED. 1389) and *kuṟ-* ('short', DED. 1537). The legends about Agastya's origin in the water-pot, his southern migration on a colonising mission, his authorship of the first Tamil grammar and his residence in Potiyil or Potikai, the characteristic Vēḷir institution of an Assembly Hall and his being the *kula-guru* of the Pāṇḍyas—all provide irrefutable evidence that Agastya was a Vēḷir priest-ruler (or rather, a clan). The term '*agastya*' itself seems to be of Dravidian origin. A frequent introductory formula in the seal-texts is **aka-t-*, (O.Ta. *akattu*) meaning 'inside', that is, 'within the Citadel or Temple-Palace'. Thus the Chief Priest of the Sacred Pool was an '*akattiyaṉ*', one who lived inside the Citadel or the Temple.

4.16. The term *muṉi* or *muṉai* has also Dravidian and specifically Vēḷir parallels. Muṉaiyar are enumerated among the eighteen Vēḷir clans which migrated south. One of their colonies was called Muṉai-p-pāṭi and they distinguished themselves as commanders under the Tamil kings.

The Symbol :

4.17. This is one of the commonest symbols. It is generally found preceding or . The Finnish suggestion that the sign

represents a 'great person' fits the context; but the Sumerian analogy through which the pictogram is equated to a 'garden' is not close.[82] I interpret the pictogram as a pillar set on a base. This gives the following set of apt homophones :

(1) *pōtikai* (Ta.): capital of a pillar, stake; *pōtika* (Ma.): *bōdige*, *bōduge* (Ka.); *bōdigē* (Tu.): capital of a pillar; *bōdiya*, *bōde* (Te.): trunk of a tree (DED. 3746).

(2) *potikai*, *potiyil* (O.Ta.): residence of Agastya, a Vēḷir city, a Hall of Justice, Assembly Hall, platform under a tree in village common (from *potu*: common. DED. 3684).

Old Tamil literature contains many references to the word. Agastya lived on a hill called Potikai or Potiyil (*Akam.*, 25). Many Vēḷir cities were called Potiyil (*Akam.*, 322; *Puṟam.*, 128). The Vēḷir themselves were called Potuvar (=*Iṭaiyar*) (*Paṭṭiṉa.*, 274–282). Numerous references in the Sangam works (*Akam.*, 127 etc.) tell us that *potikai* was an important social institution of the Vēḷir and the Kōcar. This was a meeting place, generally under a tree, of the Village Elders. The archæological evidence leads us to connect **poti-k*(-*v*) with the Pillared Hall in the Citadel at Mohenjo-daro which is now seen to be the Assembly Hall or Palace, analogous to O.Ta. *potikai*.

The Symbol :

4.18. This is a frequent terminal sign occurring alone or ligatured with the suffixes or . The pictogram clearly shows a person with a pole across his shoulders carrying loads suspended on either side. Gurov has suggested an apt pair of homophones :[83]

kā: pole with ropes hung on each end to carry loads on the shoulder (DED. 1193).

kā: to protect, guard (DED. 1192).

He suggests that the symbol could stand for a protecting deity, or for the word 'protection' (associated with amulets) or for a

weight (when preceded by numerals). The Finnish team also gives two widely differing meanings to the symbol, starting from *kaṟai* : pole (DED. 1155) :[84]

(1) *-kaḷ* : plural suffix.

(2) *kaṟ(-u)* : wash, bathe (>bath) (DED. 1154).

The difficulty with these interpretations is that they are not consistent and do not suit the context. The phonetic values proposed by the Finnish are not acceptable on linguistic grounds.

4.19. The terminal position of the symbol and its ligature with U or ↑ indicate that it is a honorific of a male person. The preceding numerals indicate a group rather than a single person. I suggest that the phonetic and functional values can be deduced through these homophones :

poṟ-(u) : (*a*) to bear a burden; load, weight (DED. 3729).

(*b*) to take responsibility, to undertake, carry out, to undertake an office (DED. 3729).

(*c*) seal (of office) (DED. 3728) (O.Ta. *Poṟi*).

Old Tamil usages are instructive. The noun *poṟi* : seal (lit., responsibility) may actually be earlier than the verb : *poṟi* : inscribe, as the verbal form in this sense is not found outside Tamil. *Poṟaiyāṭṭi* (Ta. Lex.) occurs in the sense of a priestess attached to a temple. In the light of this evidence, we may interpret the symbol as a priestly official attached to the Temple-Palace and entrusted with specific responsibilities. It is not likely that the symbol stands for a 'seal' as the morphographic pattern of the script indicates that anthropomorphous signs always stand for human beings. The ligatured symbols may be compared with O.Ta. *Poṟai* and *Poṟaiyaṉ* (Chēra names).

4.20. The decipherment of the symbols has revealed that the group, later known as the Chēras in the Tamil history, occupied the highest status in the Proto-Indian Priestly hierarchy and held

all the most important offices. The **Cēr-(a)* were the Keepers of the Granary. The **Kuṭṭ-(a)* were the Priests of the Sacred Pool. The **Poṟ-ey* were the Keepers of the Seals and Functionaries in the Temple. From this evidence it can be inferred that the High-Priest or Priest-King **Vē-y/(n)t* was himself probably a " Chēra ".

The Symbol : The Scribe.

4.21. The scribe was an important person in all the great ancient civilizations. He was generally a priest and entrusted with the accounts of the Temple. His knowledge of writing, probably a jealously guarded science handed down from father to son, gave him unique prestige and a voice in temple and civic administration.

4.22. The symbol represents a row or series of lines within an enclosed space. This suggests the following homophones :

(1) *vari-cai :* order, regularity, line, row, series (DED. 4310).

(2) *var-(ai)* : boundary, limit, ridge of a field, enclosure (DED. 4301).

(3) *var-i* : line, streak, stripe, course (as of bricks) furrow, rule (DED. 4304).

(4) *vari, varai* : to write, to scratch, inscribe, cut ; writing, letter of alphabet, manuscript writer, scribe, clerk (DED 4304).

A glance at the entries in the DED. shows that the only widely prevalent word in Dravidian languages for ' writing ' is **var-(v)* (DED. 4304). It is significant that the word is connected with the roots, ' to cut, inscribe, scratch ', etc., indicating its origin.

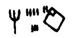
4.23. Old Tamil inscriptions preserve the word in two forms the true meaning of which does not seem to have been so far recognized :

(1) *vāriyaṉ, vāriyam* : The inscriptions dealing with temple and village administration use these terms frequently,

in the sense of executive committees or officers elected by the villagers from time to time to look after various aspects of civic administration.[85] This appears to be a later development when the self-governing village communities in the Tamil country reached their zenith during the Pallava and the Chōḷa periods. In its origin, the term *vāri-y-aṉ* probably connoted the scribe or the accountant who maintained the temple accounts. The term is clearly connected with the root *vari*, *varai* : to write.

(2) *mārāyaṉ*, *mārāyam* : The temple inscriptions list *mārāyam* as a temple service (S.I.I., II, 66). The term is also used in the sense of 'messenger, good news' etc. (Ta. Lex.). The derivation proposed by Ta. Lex. from *mahārāja* is clearly incorrect as it does not suit the context. If the attribute *mā* is separated, the true meaning of the word is recognised, particularly when it is compared with the Telugu forms, *vrāyu*, *rāyu*, *rāsu* : to write, a scribe (DED. 4304). The antiquity of the phrase *mā-rāya* (The chief scribe) can be inferred from the frequent digramme **mā-var-(v)* on the seal texts.

The Symbols and :

4.24. These two symbols occur frequently and occupy about three per cent of the textual matter according to the Soviet and the Finnish tabulations.[86] The most marked characteristic of the symbols is the prefixed numeral signs. In fact a large number of the texts merely consist of these symbols with prefixed numbers with or without one of the 'introductory' blocks preceding them, e.g. 

4.25. Langdon suggested that the symbols represented an inflection or postfix placed after numeral signs.[87] Hunter amplified the idea by proposing that the symbols represented the ordinal

suffix.[88] The Soviet suggestions that the symbols may represent a measure (a ' handful ') or some other ' especially classified suffixes ' occurring after numerals also follow the same trend of thought.[89] However, I have already pointed out how unlikely it is that these carefully cut seals should be mere inventories. It has also been established that in the cases of the ' fish ' symbol that the preceding numerals represent the phratry number of the person mentioned in the seal-text. It thus became clear to me that the symbols and represent categories of persons organised in some numerable groups. The recent Finnish proposal that the symbols represent ' tax-collectors ' is not supported by Dravidian parallels.[90] However, their earlier suggestion that these symbols denoted ' workers ' turns out to be nearer the mark.[91]

4.26. The Finnish team considers the two pictograms and to be merely graphic variants of the same symbol on the basis of identity of sequences. This is, however, not an infallible test. For example, the signs and occur in identical contexts but are different from each other. Similar is the case with the pair and . There are many more examples of such signs showing that modifications of symbols were utilised in this script to represent similar but not identical meanings. Hunter pointed out that the difference in morphography of the two symbols was ' marked ', though he too considered that they represented the ' same word '.[92] It turns out, however, that and represent functionally similar but distinct categories of persons. A precious clue, apparently overlooked by the previous investigators, is that is followed only by and never by

4.27. The symbols represent the fore-arm. A careful study of the variants of each of the two symbols shows that represents an ' open ' hand with all the five fingers spread out and represents a ' closed ' hand with the fingers kept together. According to the morphographic scheme of the script, it is the modifying elements which are crucial in such cases. The two postures suggest :

(1) *viḷ* (*veḷ*): to open, expand, spread out (DED. 4459, 3446).

(2) *kŏḷ*: to seize, hold; grasp (DED. 1788).

4.28. A search for Dravidian parallels for numbered groups with similar names and connected with the idea of ' hands ' yileded immediate results. Medieval temple inscriptions tell us about the two great formations in the armed forces of the Tamil royal dynasties, *viz.*, the *vēḷa*(*i*)*paṭai* and the (*kai-*) *kōḷ*(*ar*) *paṭai*; (*paṭai* : army formation). Both the formations constituted the elite corps of the army and generally served as the personal body-guards of the king.[88] According to tradition, they were sworn to defend the person of the king with their lives and to kill themselves on the death of the king. The prefix *terinta* or *teriñca* found before the names of these Formations in the inscriptions has been interpreted as ' select ' or ' elite '. However, it is almost certain that the word is derived from *tĕṟṟu* : to swear, take an oath (DED. 2856) as this was the special characteristic of the group. Scores of these formations are known to us from epigraphs, generally named after some bombastic Sanskrit title of the king under whom they served. The inscriptions sometimes refer to numbered formations (A.R.E. 120/1905). They had a corporate entity and made and received endowments as such. Some examples are given below :

Vēḷai-kārar :

(1) *Rājarāja-t-terinta valaṅkai vēḷaikkārar*.

(2) *Vikramābharaṇa-t-terinta valaṅkai vēḷaikkārar*.

(3) *Kṣatriya śikhāmaṇi-t-terinta valaṅkai vēḷaikkārar* (S.I.I., II, 66).

Kai-k-kōḷ(*ar*) :

(1) *Pārthiva śēkhara-t-teriñca kai-k-kōḷar* (ARE, 491 of 1918).

(2) *Samarakesari-t-teriñca kai-k-kōḷar* (Ibid., 24 of 1895).

(3) *Vikramasimha-t-teriñca kai-k-kōḷar* (Ibid., 278 of 1911).

4.29. It is relevant for our purposes to note the following differences regarding the two formations :

(1) While both the groups served under the Chōḷas, the Vēḷaikkārar were never known to have served under the Pāṇḍyas. It appears that the reason is that the Vēḷaikkārar (related to the Vēḷir as indicated by their name) considered themselves socially superior to the Pāṇḍyas who seem to be the ruling clan of the Kōcar confederacy. Similarly the Vēḷaikkārar groups figure as temple attendants only in the Chōla inscriptions. (*Vide* Section 5 and Excursus B on the Kōcar).

(2) The Vēḷaikkārar prefixed the epithet '*valaṅkai*' 'right hand' which is conspicuously absent from the name of the other group. However, the variant '*kōḷar*' occurring in the inscriptions for *kai-k-kōḷar* proves that they also had the prefix *kai* : 'hand'. By implication the (*kai-*)-*k-kōḷar* represented the 'left hand' forces. This is strengthened by the fact that the *kōḷ*(*ar*) *paṭai* was made up of the Kōcar, the group which ranked lower than the Vēḷir in the social scale. R. Raghava Iyengar noticed the connection and even derived *kōḷar* from *kōcar* (*Kocar*, p. 57). The great division of the Tamil castes into 'right hand' and 'left hand' groups seem to be connected with this schism.

4.30. In the light of the Old Tamil parallels we may now interpret the symbols thus :

: open (right hand) : *viḷ/veḷ ; O.Ta. : (*valaṅkai*) *vēḷai* ;

: closed (left hand) : *kōḷ ; O.Ta. : (*kai-*) *kōḷ-*(*ar*) ;

It may be seen that the 'open hand' with spread-out fingers shows the thumb at the right end showing that it is the right hand (facing the reader). It is known from the morphography of the script that human figures and asymmetric symbols face to the right.

4.31. Combining the Old Tamil evidence with what we have already learnt about the Proto-Indian social structure, we may draw the following picture : The Citadel housed, in addition to the priests, the Palace and Temple attendants and guards. These were drawn from both the major social groups, *viz.*, the people of the Citadel (Vēḷir) and the people of the City (Kōcar). They were called the 'Right-hand' and the 'Left-hand' attendants respectively probably from the position they occupied in the presence of the Priest-King or the Deity, no doubt an indication of their relative social status. They were divided into a number of formations indicated by the prefixed number to the symbols. The seals are the corporate official seals of the formations. They lived in separate "cantonments" (as we also learn from Tamil epigraphs) designated by the symbols and . From the analogy of the Old Tamil inscriptional *vēḷam, vēḷakam, viḷākam,* (the quarters of the *vēḷai* regiments), we can equate the symbols with **veḷ-aka* and **kǒḷ-aka* respectively; *aka-m* : inside, house (DED. 8).

4.32. The recognition of the symbols for the attendants leads to an understanding of the meaning of , a common epithet occurring before the 'attendants' symbols and also before the 'fish' sign. Langdon drew attention to the resemblance of the symbol to the Sumerian pictogram '*bad*', 'open' (M.I.C., II, p. 454, No. 15). Assuming that the symbol has the same pictorial value in Proto-Indian, it seems possible to interpret it through the Dravidian word *tiṟ-a* : to open (DED. 2667).

We can identify the meaning of the symbol through the following etyma homophonous with **tiṟ>*tĕṟ* :

teṟṟ-u : to become tied together (as a man who is closely bound to, a servant, connection, friend) (DED. 2836).

tēṟṟ-u : to swear, take an oath ; *tēṟ-unar* : trust-worthy persons ; *tēṟ-iṉar* : tested or tried friends (DED. 2856).

4.33. In the medieval inscriptions, we find the attribute *terinta* or *teriñca* applied to the army formations consisting of persons who had sworn fidelity and taken an oath to protect their sovereign with their lives. Hence it is likely that these inscriptional terms are derived from **tĕṟ-* : ' faithful, trust-worthy '. In the old Tamil poems we come across *tēr* as an attribute to personal names, e.g., *tēr vēḷ*, *tēr ceṟiyaṉ* etc. It does not appear that in this context *tēr* could mean a ' chariot '. It is likely that, as in the inscriptions, the attributive *tēr* found in the poems is also derived from **tĕṟ-* and should have originally meant, ' faithful '. The symbol therefore corresponds to **tiṟ* or **tĕṟ* and means ' faithful ', ' sworn to fidelity ' or ' dedicated (to the service of the king or the deity ').

4.34. The digrammes and , **tiṟ-viḷ/*tiṟ-miḷ* which occur commonly in the seal-texts are of great significance for another reason. The phrase seems to be the origin of the word ' Dravidian ' itself. The probable derivation is suggested below :

**tiṟ(-v)-viḷ(-v)/*tiṟ-(v)-miḷ(-v)>*

tiṟamiḷa, tiṟamiḍa >dramiḷa, dramiḍa >drāviḍa.

The oiginal meaning of the term *drāviḍa* was therefore ' a faithful or dedicated Vēḷ ' (cf. *tēr-vēḷ* ; *Puṟam.*, 133). The title may be compared with *tamiḻ-ara(i)yaṉ* or *tamiḻa-taraiyaṉ* occurring in the medieval inscriptions.

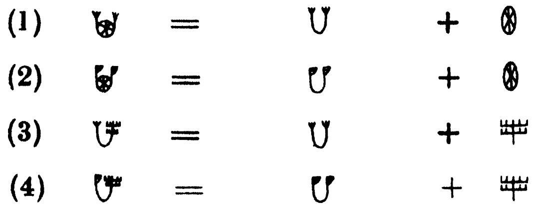
The Symbols and :

4.35. These symbols must represent masculine singular personal nouns as they are invariably followed by . A comparison of the two symbols with each other makes it clear that they represent a pair of uplifted arms. The essential difference is that in the fingers are open, while in , the fingers are tightly shut. According to the morphography of the script, it is the modifying elements which are phonetically significant. Hence can be connected with *viḷ-(veḷ-)* : to open, spread out; will then express *kōḷ* : (to) grasp. My interpretation is that these two symbols

stand for the chieftains or commanders of the formations of attendants and guards with similar names and represented respectively by the symbols and . A comparative study of the pictograms makes it clear that is not connected with , but with . The compound symbol is interesting. The word *$v\bar{e}\d{l}$-$an\underline{r}$ corresponds to O.Ta *vē̤lā̠n*, a *vēḷāḷa* chieftain.

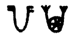
Ligatures with and :

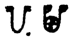
4.36. Perhaps the best proof foı the validity of the parallels drawn above comes from the interpretation of the following compound ideo-phonograms :



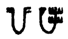
4.37. We have already identified all these symbols inividually. The symbol is not the plural of , but an ingenious graphic device to distinguish its meaning from the latter. is an attribute meaning ' great ' which is derived from the homonymy between *neṭ-(-ṭ-ai)* : a weapon and *neṭ-u* : tall, great. The graph suggests another set of homophones also connected with the concept of weapons : *paṭai* : (1) weapons, arms ; (2) armed formations (DED. 3195).

4.38. By substituting the known values we can explain the compound ideo-phonograms thus :

(1)  : The Chief of the *vēḷai* (Right-Hand) Attendants of the Temple.

(2)  : The Chief of the *kōḷ* (Left-Hand) Attendants of the Temple.

(3) : The Chief of the *vēḷai* (Right-Hand) Guards.

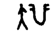
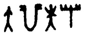
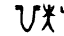
(4)  : The Chief of the *kōḷ* (Left-Hand) Guards.

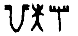
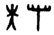
We may consider (1) and (2) as the equivalents of civil servants (of course in a hierarchy exercising religious and temporal authority), while (3) and (4) are their military counterparts. Whole phrases denoted by these compound ideo-phonograms have survived in later Dravidian languages, attesting to the validity of the decipherment :

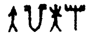
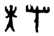
(*mū-*) *vēnta-vēḷāṉ* : a vēḷāḷā chieftain (Ta., insc.,) (corr. to 1 above) (S.I.I., II, 86).

paḍe-vaḷḷa : a general (Ka., DED. 3195) (Corr. to 3 above).

The digramme : :

4.39. This digramme occurs finally in contexts where alone can occur. The sign, however, does not follow which otherwise behaves exactly like . From these facts I inferred that is not an independent suffix like but forms a single word  which is functionally equivalent to or ; in other words the digramme forms a nominal suffix or an independent epithet. There must, however, be a difference between and . The symbol does not seem to be a masculine determinative as the masculine singular meaning is contained in itself. The pictogram could well represent a 'servant' from its simplicity. However, positional analysis led me to the conclusion that in a text like  the symbol does not represent the 'servant' of  (a trigramme which occurs frequently) since the digramme itself is a suffix. We are then faced with the following arrangement :

(1)  : A person in category with the name  .

(2)  : A person in category with the name  .

4.40. We already know that the text in (1) is the name of a priest-ruler. Therefore, the name in text (2) is that of a priest-attendant. We can infer that (*a*) the priest-attendant had some social status as he could own seals and (*b*) the priests and the priest-attendants came from the same group since they could have identical names (with differing suffixed honorifics).

4.41. As I had already discovered that the priests of the Proto-Indian civilization correspond to the Vēḷir of the Old Tamil civilization, it occurred to me that the priest-attendants could correspond to Vēḷ-āḷ-ar (lit., the 'men' of Vēḷ), who were, in the Tamil society, peasants, men at arms and artisans in the service of the Vēḷir chieftains. Though their social status was lower, the Vēḷāḷar belonged to the same stock as the Vēḷir. They had common names, could marry into each other's families and were generally regarded with almost equal respect. (See Excursus A).

4.42. The next step was to search for a phonetic parallel for in old Tamil with a corresponding meaning. The pictogram is a man and the only suitable Dravidian word is *āṇ>āḷ*: man, male, servant (DED. 342). The digramme then reads **anṟ-āṇ*. The nearest old Tamil equivalent is *ant-aṇ*, *ant-aṇa-ṉ* or *ant-aṇ-āḷ-aṉ* (DED. 126 ; Ta. Lex.) : a brahman (=priest).

4.43. It might appear *prima facie* that the meanings do not correspond. However, when I investigated the matter further by looking into the various contexts in which the word occurs, I became convinced that *ant-aṇ-* was an ancient compound word having originally a different meaning and the connotation of a 'brahman priest' was acquired only after the advent of Brahminical Hinduism. We have already seen a similar transfer of meaning for **vē-y/(n)t* (O.Ta. *vēntu*, *vētiyaṉ*) which originally meant a high priest and came to be applied to the Brahman when he became the high priest of the society in the new dispensation. (The term continued to signify the Dravidian king even when he ceased to be the high priest).

4.44. We gather from old Tamil poems that *antaṇar* were a kind of 'inferior' brahmans who did not perform brahminical rites but were engaged in cutting bracelets and bangles out of conch shells (*Akam.*, 24). The poet Kīraṉ-ār, an *antaṇaṉ* is described as engaged in this 'unbrahman-like' profession. We learn from the *Tivākaram* that shell-work or bead-making (*kuyiluvam*) was one of the six prescribed occupations of the Vēḷāḷar. In fact, the phrases *vēḷāḷar aṟu toḻil* and *antaṇar aṟu toḻil* (Ta. Lex.) resemble each other, and the six 'brahminical' occupations assigned to the *antaṇar* in the *Tivakaram* have an appearance of artificiality.

4.45. Another important clue comes from *Tol. Poruḷ.*, 627 which prescribes, rather surprisingly, that *antaṇāḷar* cannot be precluded from kingship (*aracu*). It is clear that the term cannot mean a brahman here as he never claimed the right to kingship. It is significant that the sūtra occurs in a series dealing with the Vēḷāḷar. The preceding Sutras 617 and 618 clearly specify the 'common characteristics' of '*aracar*' and '*antaṇar*'. The real import of these sūtras will become clear if *antaṇar* are equated with *vēḷāḷar* and *aracar* with *vēḷir*. We learn from inscriptional evidence that *araiyaṉ* (*araicaṉ*) was the most favoured epithet of the Vēḷir Chieftains.

4.46. The words *aṉt-aḷa-m*: coat of mail, *attavāḷam*: upper garment and *ant-aḷ-aka-tt-āḷar*: warriors in the Chōḷa army (See Ta. Lex. for these entries) all seem to be derived from *ant-aḷ-*, the royal attendant or warrior.

4.47. Since U is **anṟ-* and ⅄ is a man or servant, the digramme ⅄U can be 'visually' equated to *Āndhra-bhṛtya* a name of the Āndhra kings. This name had long been a puzzle as there seemed to be little distinction between the Āndhras and the Āndhra-bhṛtyas. It now appears possible to equate Āndhra-bhṛtya (the 'servant' of Āndhra) with Vēḷ-āḷa (the 'servant' of the Vēḷ) since we have other evidence linking the Āndhras with the Vēḷir (See Excursus A).

5. THE PEOPLE OF THE LOWER CITY

5.1. It is understandable that we do not hear much about the common people from the seal-texts which relate (with some exceptions) to the ruling priestly classes. Fortunately there is another category of inscriptions which helps us in this regard. The inscribed votive objects consisting of thin plates, prisms and similar material, particularly from the lowest levels at Harappa, as well as the graffiti on pottery may reasonably be regarded from the circumstances as mostly relating to the common people. The symbols U , ΔΔΔ and belonging to this category seem to denote the common people.

The Symbol U :

5.2. The 'cup' symbol occurs mostly on the votive plates and prisms and is generally preceded by one to four long vertical lines. Gurov has interpreted the 'cup' symbol as an offering and the preceding numeral signs as indicating the number of offerings.[94] However, the numeral never exceeds four. If quantities were intended, one should expect a greater range of numbers. Volcok's suggestion that the numerals represent four types of offerings is even more difficult to accept as it is strange that different kinds of offerings should be indicated by numbers.[95]

5.3. My investigations of the numeral signs on the seal-texts have shown that,

(i) A fixed 'numeral' sign in a block, generally indicates a homophone and not a number.

(ii) Variable numeral signs in a block function truly as numbers and generally indicate the number of phratries in a clan or other numbered groups like army formations.

5.4. I, therefore, started with the assumption that the 'cup' symbol represents a clan which was divided into four numbered phratries. This led to the following homophones :

(1) *kōy* (O. Ta.) : a vessel for taking out toddy (DED. 1842) (cf. *Puṟam.*, 300).

(2) *kōya-*, *kōca-*, *kōva-* : An ancient clan of the Tamil country divided into four phratries (*nāṟ-kōcar*). They had a strong tradition of migration from the North and were in perpetual conflict with the Vēḷir. (*vide*, *Kōcar*, R. Raghavaiyangar, 1951). (Excursus B)

(3) *kō-*, *kuyava-*, *kucava-* : potter clan in Tamil-Malayalam and Kannada-Tulu areas (DED. 1468).

(4) **kō-* : names of several Dravidian hill tribes ; (from *kō* : mountain, DED. 1811).

5.5. It is remarkable that so many of the Dravidian tribe-names commence with *kŭ* or *kŏ*. Confer Kota, Koḍagu, Kolami, Gondi, Koṇḍa, Khond, Koya, Kui, Kuwi, Kūbi, Kurukh, etc. (DED.). Most of these names seem to be derived from *kō* : mountain, and denote hill tribes.

The Symbol △△△ :

5.6. This is one of the easiest pictograms to interpret and clearly represents hills or mountains. Its occurrence on pottery graffiti links it with the common people and its probable phonetic value **kō* : mountain (DED. 1811) connects it with the 'cup' symbol. The two symbols are most probably synonyms. The 'hill' symbol is more often used than the 'cup' symbol on the seal-texts and may indicate a further development of the script. The 'hill' symbol is a valuable confirmation that the common people or the working classes of the Proto-Indian civilization hailed originally from the mountains. It is significant that *veḷi* (plains, open country, DED. 4526) was a common Vēḷir name, (*e.g.*) Veḷimāṉ, Veḷiyaṉ Tittaṉ etc. We can, therefore, infer that in the Proto-Indian polity, the ruling classes belonged to the plains and the working classes came from the mountains. Apparently the system of importing servants from the hills to the plains of Hindustan is at least four millennia old !

5.7. This identification is supported by two remarkable parallelisms. According to my decipherment the People of the Lower City correspond both to *pāṇṭiya* ('City-dweller') and *kō-y* ('Mountain-people'). We learn from old Tamil history that the Pāṇḍyas were particularly associated with the Kōcar (See Excursus B). We also have reason to believe that the Pāṇḍavas were hill-tribes, to wit, their polyandry.

5.8. The identification of as **kō*, corresponding to the O.Ta. Kōcar leads to the recognition of the two symbols either of which is most commonly prefixed to the 'hill' symbol as totem or clan symbols :

: axe or knife fixed through a wooden handle (*vide*, Diringer, 1968, II, p. 71 for a very close Hittite parallel).

The homophones are :

(1) *maṛu* : axe, hatchet, axe with blade fastened through wooden handle (DED. 3889).

(2) *maṛa-v-ar*, *maṛavar* : martial tribes of Tamil country associated with the Kōcar.

: weed, clump (*vide*, Hunter, p. 208 for an Egyptian parallel).

The homophones are :

(1) *kaḷ-* : weed (DED. 1157).

(2) *kaḷḷar*, *kaḷavar* : a martial tribe of Tamil country associated with the Kōcar.

5.9. According to the old Tamil tradition, Kaḷḷar and Maṛavar were together known as *akam-uṭai-y-ār* which has generally been interpreted as indicating the origin of these clans as palace attendants. They were considered as socially inferior to the Vēḷ-āḷ-ar. The Kōcar clans (including Maṛavar, Maṛavar and Kaḷḷar) formed the fighting arm of the Pāṇḍya kingdom, the counterpart

of the Vēḷāḷa or Vēḷaikāra forces under the Vēḷir (including the Chēra and the Chōḷa kingdoms). Continuing the parallel we may interpret the modified symbols and as representing respectively workers inside the Citadel where their services would certainly be required for menial duties and those outside living in the City (*e.g.*) artisans, etc.

5.10. We have already seen that Old Tamil literature has numerous references to *aka(m)-* : the inner city and *puṟa(m)-* : the outer suburbs corresponding to the Proto-Indian 'lower' city. The symbol (four roads outside the walls) may be compared with O.Ta. *puṟa-c-cēri* (outer suburbs). By contrast the symbols and can be interpreted respectively as *aka*: 'in' (DED. 8) and *puṟa*: 'out' (DED. 3554). The priest-rulers were the 'insiders' (cf. : *akattiyaṉ*). The working classes were the 'outsiders' (cf. : *puṟattiyaṉ*). It is remarkable that the Pāṇḍavas whom I have equated with the outer or lower city people, are called the Pauravas in Sanskrit (lit., the townsmen). It appears likely that the Sanskrit word *pura* : 'city' is the Dravidian *puṟa* : 'outer (city)'.

The Symbol :

5.11. This symbol occurs very frequently on the votive texts. It is also known on pottery graffiti. An exceedingly interesting fact about this specialised symbol is its occurrence among the graffiti on the South Indian megalithic pottery, as convincingly demonstrated by Lal (*Ancient India*, 1960, Pl. XXXI-B, 47). The Finnish team has suggested that the picture depicts a human being in a sitting posture (indicative of dignity) on the basis of egyptian analogies. They identify the symbol with the 'Mother Goddess' merely on the basis of its frequency and assign an arbitrary phonetic value (*ammā*) to it.[96]

5.12. I am convinced that the pictogram is the representation of an infant child. Note the relatively large head, the curving back, the folded limbs and the posture, all suggestive of an infant

in embryonic position. This recognition suggests suitable homophones :

(1) **eḷa-* : young, tender (DED. 436).

(2) *eḷi-* : low of rank (DED. 728).

(3) *iḷa* : an epithet of the Kōcar tribe.

5.13. We learn from old Tamil works that the Kōcar were generally called Iḷaṅkōcar, or simply as the Iḷa(i)yar. Personal names like Iḷankō (not, 'prince' in this context) and Iḷavaṉ are found in old Tamil poems and inscriptions (TBI., 9, 27 & 43).

5.14. There are two other symbols which seem to give **eḷ-(v)*, as an epithet of **kō-(y)*, the mountain-people :

: This frequently occurs before the 'cup' symbol and is an attribute. It can be interpreted thus :

(1) *iḷa-ku* : to become relaxed as a bow-string, to loosen as a rope (DED. 433).

(2) *iḷa-* : O.Ta. epithet for the Kōcar

: This symbol shows a squatting person ligatured to the 'cup' symbol. The posture suggests :

(1) *iḷa-ku* : to lift one's body slightly from the ground (DED. 432).

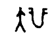
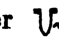
(2) *iḷa-* : O.Ta. epithet for the Kōcar.

5.15. It is clear that the epithet *iḷa-m* cannot mean 'young' when applied to a tribe. It must be a proper name. Raghava Iyengar has shown that the stories of Iḷa and Kuśa found in Sanskrit sources seem to refer to the same people as the Tamil Iḷaṅkōcar. He has also established that Vatsa, the name of the rulers of Kauśāmbī was a literal translation of Ta. *iḷa*. (Raghava Iyengar, *Kōcar*, pp. 8-9 ; 47-48). (Please also see Excursus B for more details on the Kōcar).

5.16. The name *iḷa* or *eḷa* gives us a hint about the probable place of origin of the Kōcar, the mountain-people who inhabited the Lower City. The nearest hilly tract from where they could have come down to the plains of the Indus Valley is in Baluchistan. The proximity of Elam to Baluchistan and the reported affinity of the Proto-Elamite language to Dravidian and the Proto-Elamite script to the Proto-Indian script make it likely that the Iḷaṅkōcar came originally from Elam. (I acknowledge with pleasure that this most important suggestion was made to me by Prof. Balakrishnan Nayar when I discussed my identifications with him).

5.17. The Tamil deity Murukaṉ (lit., the young one ; cf. Skt. Kumāra) is also the Lord of the Hills. His name and his habitat strongly link him with the Kōcar. In the Tamil country most of the temples dedicated to Murukaṉ are found on the hill-tops in the central highlands occupied by the Kōcar in ancient times. It is likely that Murukaṉ is the apotheosis of the chief of the Iḷa tribe ("the young' as the term came to be understood) or the Kōcar ("the mountain-people"). It is probable that at least in some contexts the digramme may represent the proto-type of this deity.

The Symbol :

5.18. This is a terminal symbol with functions analogous to those of  . It is thus a nominal suffix or an independent epithet. That it is not a grammatical suffix is shown by the plural . It is so often final after  , that it seems to have a special relationship with the common people of the Lower City. The pictogram very closely resembles the Sumerian sign for 'hand' (Falkenstein, No. 9). In comparison with the other 'hand' signs we have considered earlier, it is seen that this symbol does not show the forearm and appears to indicate the horizontal or lower position. From these facts I infer that the symbol represents a worker or a servant lower in status than the attendants or guards on the Acropolis (from either major social groups). The symbol possi-

bly represents a serf or even a slave. It cannot represent the feminine suffix as it is sometimes followed by U .[97] The examples of the other 'hand' signs also indicate that the essential meaning of the symbol and its phonetic value would be indicated by the posture of the hand, rather than by the 'hand' itself. This line of reasoning leads to the homophones :

(1) *iṟ-i*: to fall, drop down, low, inferior (DED. 426).

(2) *ēṟai* : A poor person (DED. 728 ; (but this goes better with 426).

(3) *eṟava-r* : persons belonging to a low caste (serfs) in Kerala.

(4) *eṟai-y-ūr*: the 'hamlet of the shepherds' (TBI. 28).

5.19. It is interesting that the Kōcar are found associated with the words derived from *iṭ*-, *iḷ*-, *iṟ*-, all connoting inferiority of status. Here we have evidence that these people were the lowly working classes of the Proto-Indian civilization.

5.20. It appears possible to construe the symbol ⁅ following a name in two ways. The preceding name could be that of the serf himself : or it may be the name of his master. The usage has probably to be judged from the context.

5.21. It is necessary to distinguish between the epithets **iṟ*- applied to the ruling classes and **iṭ-/iṟ* of the working classes. In later Tamil, both became homophones (*iṭai*) causing some confusion in identification.

5.22. We can also notice the 'ligatured hand' signs here. The ligatures may show either a pair of arms or a single hand. The latter may be upraised or drooping down. The general indications are quite clear. The 'pair of arms' represents a chieftain of a formation of attendants or guards. The single upraised 'ligatatured hand' indicates an attendant belonging to the upper classes. The 'drooping hand' stands for a servant from the 'lower classes'.

5.23. The symbolism of the 'hands' in the script is quite fascinating, as it speaks a universal language. The suggested interpretation of the 'hand' signs furnishes a good example of the technique of 'visual comprehension' advocated by Forrer. The actual existence of the Right Hand and Left Hand castes and army formations in the old Tamil polity provides parallels attesting to the validity of the decipherment.

6. THE MYTHS OF THE PROTO-INDIANS

6.1. The vast majority of the Proto-Indian seals depict an animal in the field, seemingly unrelated to the inscriptions. There are, however, a few seals which depict scenes which give us a rare glimpse into the myths and legends of the race. Here I shall deal with four such scenes which may be called,

(1) The priest in the water-pitcher.

(2) The hunter on the tree.

(3) The hunter with the tiger.

(4) The serpents on the tree.

(1) *The priest in the water-pitcher :*

6.2. The seal (illustrated in F.E.M., II, Pl. XCIX, ill. A) is typical of the rest. The scene shows a horned personage wearing his hair long and having bracelets on his arms standing inside a vessel decorated with pipal leaves. A similarly adorned person kneels in front of the vessel with what appears to be an offering of a fowl in front. A ram stands behind him. There are seven robed figures (in contrast to the other two persons who appear to be naked) standing in a row in the lower field.

6.3. I interpret the scene as depicting the mythical origin of 'Agastya' the High-Priest of the Proto-Indian civilization as well as the origin of the Seven Vēḷir phratries in the Sacred Pool.[98] The story of the origin of Agastya is a water-pitcher (hence Ta.

kuṭā-muṇi., Skt. *kumbha muṇi*) is too familiar to need recapitulation here. The water-pitcher shown on the seal is a pun on the words *kuṭa-* : water-pot (DED. 1376) and *kuṭṭa-*: pool (DED. 1389). This is a characteristic feature of the scenes on the seals as well as of the pictographic script. The two naked figures appear to be priests, judging from the representation in the so-called ' pasupati- ' type seals. The tradition of ascetic and ceremonial nudity in later Indian religions indicates that the Proto-Indian priests were naked on ceremonial occasions like their Babylonian counterparts. The rising of the priest from the pitcher symbolises the origin of the priestly rulers from the sacred pool. The scene thus represents not only the Agastya legend but also the popular myth about the origin of the Vēḷir (including Chalukyas) from a ' *kuṇḍa* ', later interpreted as a ' sacrificial pit '. The seven robed figures represent the Seven Vēḷir phratries, to whom the seal texts refer.

The stories of the Seven Sages (*Sapta-ṛṣi*) and the Seven Mothers (*Sapta-mātṛka*) appear to be connected with the Vēḷir clans. In particular, the latter legend seems to signify the matrilineal social structure of the Vēḷir. The matronyms of the Āndhra kings, the Chōḷa and the Chēra custom of marrying the Vēḷir women, the Nambūdri custom of marrying the Nāyar women and the matriarchal system in Kerala can all be traced probably to the Proto-Indian civilization through the Vēḷir. Ramanathan (BSOAS, XXII-2, 1969, pp. 323–343) notices the survival of matriarchal customs among the exogamous septs (*kiḷai*) of the Kōṭṭai Vēḷāḷar, an extremely conservative community which traces its origin from the Iruṅkōvēḷir. Incidentally, the text on this seal refers to a priest of the *(*C*)*ō-y* clan and is unrelated to the scene depicted in the field.

(2) *The hunter on the tree*

(3) *The hunter with the tiger*

6.4. These two types of seals seem to represent the same legend. In type (2), we see the hunter seated on a kino tree

looking at the tiger on the ground growling at him (*e.g.* M.I.C., III, Pl. CXI, 353). In another variant, the hunter is on the ground attacking the tiger (*e.g.* Ibid., 357). In type (3), the hunter grapples with two roaring tigers standing on either side of him (*e.g.* F.E.M., II, Pl. LXXXIV, 75).

6.5. These scenes suggest two unmistakable parallels. One is the Babylonian story of the hero Gilgamesh with the lions. The Indian seals have replaced the lions with tigers as the Indians were not apparently familiar with the lion. The other parallel is the old Tamil story of *puli-kaṭi-māl* (lit., the hero who slew the tiger), a legend which was quite popular with the Vēḷir and the related Hoysalas. The famous verse in *Puṟam.*, 201, addressed to an Iruṅkōvēḷ, refers to both the legends, *viz.*, the Vēḷir origin in the 'kuṇḍa' (Ta. *taṭavu*) of a 'northern' sage and the name *puli-kaṭi-māl.* The verse also refers to the descent of Iruṅkōvēḷ through 'fortynine generations' from the Vēḷir who ruled Tuvarai of the 'bronze walls', almost certainly a reference to the Proto-Indian cities. According to popular tradition, the name Hoysala is also derived from the feat of an ancestor who killed a tiger which threatened a sage. The homonymy between kino tree and tiger, (both called *vēṅkai* in Dravidian) with god or priest (**vē-ṅk, -nt*) should be noted. The depiction of the tiger on the Chōḷa flag, and the place name Vēṅgi seem to be survivals of an ancient homonymy.[99]

(4) *The serpents on the tree .*

6.6. This unique seal (M.I.C., III, Pl. CXII, 387) shows a two-headed creature with sinuous bodies entwined at the base of a pipal tree. I have already shown that the priest-rulers of the Proto-Indian civilization were divided into two main groups each named after a serpent-planet. I suggest that this seal represents the twin serpent-planets or demons (*rāhu* and *ketu*). I have already suggested that the Proto-Indian worship of the serpent-planets led to Dravidian serpent-worship. Stones with entwined serpents carved on them are still to be seen under the pipal tree in

every Dravidian village. Considering the Proto-Indian penchant for homonymy I wonder whether the original name of the pipal tree was not **cara* with the loss of initial palatal in all later Dravidian languages. This may explain the association of the pipal tree with the serpents through the homophones:

**cara-? (ara-)>ara-:* pipal tree (DED. 168).

**cara->ara-:* serpent (DED. 1949).

The seven pipal leaves shown on the tree probably indicate the seven serpent-clan phratries referred to in the seal-texts.

6.7. A surprisingly close parallel for the two-headed serpent-deity seems to be found in '*palika dēyam*', the 'home deity' of the Koṇḍa Doras, a Dravidian tribe. (See *Koṇḍa or Kūbi, a Dravidian Language*, Bh. Krishnamurti, p. 29, ill. No. 3).

6.8. The combination of the two serpent-planets into a single deity also helps to explain the occasional pairing of in the texts. It is possible that also refers to the clan of the Two Serpent-Planets, **ir-mīḷ* (O.Ta. Iruṅkō Vēḷ).

6.9. The legend on the unique seal can be read thus: "The SEAL? of the Priest in the Temple-City (City-Temple)". The compound ideogram reading Temple-City or City-Temple is especially interesting. It may possibly refer to *the* City (Mohenjodaro?) or to *the* Temple therein.

6.10. An interesting parallel to the serpent-on-the-tree is the biblical story of the serpent and the tree in the garden of Adam and Eve.

6.11. In fact, the intermingling of West Asian and Dravidian myths and legends can be seen in all the four scenes described above. The religious rituals based on water, the ceremonial nudity of the priests, the stories of 'Pulikaṭimāl' and Gilgamesh, the evil Serpent-demons and the Serpent of Sin,-all these cannot be mere coincidences. They furnish visual proof of the fact that the Proto-Indian and the Sumerian civilizations had an ultimate common origin in what may truly be described as the cradle of human civilization.

SUMMARY AND CONCLUSIONS:

1. The Proto-Indian civilization was Dravidian. The decipherment of the inscriptions reveals a language which resembles South Dravidian (including Telugu) in general and Old Tamil in particular. This resemblance is accounted for by the migration of the Proto-Indian elements to the South where they created the historical Dravidian civilizations of the Iron Age in the Deccan and the Tamil country. The special resemblance to Old Tamil is accounted for by two facts: (*a*) the antiquity of Old Tamil and its preservation of the Proto-Dravidian forms, (*b*) the use of Tamil in civic and temple administration in the Tamil country (—in contrast to the Deccan where Prakrit and Sanskrit completely displaced the vernaculars until the medieval period—) resulting in a lucky preservation of ancient Dravidian terminology.

2. The Proto-Indian civilization was ruled by a priestly oligarchy. The most marked characteristic of the Proto-Indian polity was the fundamental division between the priest-rulers living on the Acropolis within the Citadel and the common people living in the Lower City. At least a section of the common people hailed from a mountainous region, probably Elam. If they spoke a different language or a dialect it does not appear to have been recorded in the inscriptions, the language of which, judging from universal practice, was almost certainly that of the ruling classes.

3. The priest-rulers of the Acropolis correspond to the Vēḷir of the Tamil civilization. They seem to have been an extraordinarily gifted people with a special genius for social and political organisation. They created not only the largest and the best organised civilization in the world during the Bronze Age: but also, after the collapse of this civilization and their migration to the South, some of the greatest kingdoms known to Indian History including the Āndhra and all its successor kingdoms in the Deccan and the Chēra-Chōḷa-Vēḷir kingdoms in the Tamil country. They established once again great cities and thriving sea-ports and created social and political organisations which closely resembled the Proto-

Indian originals and endured for more than two millennia (from the beginning of the Iron Age to the advent of the Muslims in South India). There is no parallel in recorded history for this remarkable achievement.

4. The common people of the Lower City, who called themselves 'mountain-people' and probably came from Elam, correspond to the Iḷaṅ-kōcar of the old Tamil civilization. After the fall of the Proto-Indian civilization, they also seem to have migrated south. It is remarkable that the advanced and literate Dravidian societies comprised in the present Tamil-Malayalam, Kannada-Tulu and Telugu linguistic areas were the creation of the Vēḷir, the Proto-Indian ruling classes, while the backward and non-literary Dravidian tribes mostly living in hilly areas seem to be connected with the Kōcar, the working classes of the Proto-Indian Civilization. The only exception was the great Pāṇḍya kingdom based on Kōcar hegemony.

5. The amazingly close parallelisms between the hierarchical structure of the Proto-Indian and the old Tamil polities are among the most interesting findings of the present study. These are summarised in the following Table :

Proto-Indian Polity	*Old-Tamil Polity*	Old Tamil terms phonetically corresponding to Proto-Indian Symbols	
I. *Within the Citadel :*			
Priest-King	King	*vēntu*	
Priest	Noble	*vēḷ*	Chēra-
Attendant (Right Hand Faction)	Peasant (Right Hand Castes)	*vēḷ-āḷ, ant-an*	Chōḷa-Vēḷir
Guard (-do-) ..	Warrior (Right Hand Faction)	*vēḷai* (valankai)	
II. *From the Lower City :*			
Attendant (Left Hand Faction)	Attendant (Left Hand Faction)	*akam (uḷaiyār)* (*Kaḷḷar, Maravar*)	Pāṇḍya-
Guard (-do-)	Warrior (-do-)	*Kaikōḷar*	Kōcar
Common People ..	Common people (Left Hand Castes)	*Kōcar*	

We may also notice a major difference between the two societies. In the old Tamil polity, the term '*mū vēnt-ar*' connoted the 'three crowned kings' *viz.*, the Chēras, the Chōḷas and the Pāṇḍyas, generally mentioned in that order. In the Proto-Indian polity, in term **mū vē-y/(n)t* stood for the High-Priest or the Priest-King, who appears to correspond only to the "Chēras" of the old Tamil society. The "Chōḷas" (*cūḻ*: to surround) were the Priests, Nobles and Attendants on the Acropolis. The "Pāṇḍyas" (*pāḻi*, *pāṭi*: city) were the 'townsmen' of the 'Lower City', comprising most probably, the traders, artisans, and the workers of the society.

6. It is only to be expected that not all the Dravidian elements migrated South. It is a mistake to consider Brahui and the few tribes of the North-Eastern and Central India as the only survivors of the Dravidian population in the North. It is most unlikely that the Āryans who came into India were numerically superior to the indigenous people. While the Āryans imposed their language and culture, they themselves must have been assimilated ethnically with the local population. While there are Āryan and Dravidian languages in India today, there have been no 'Āryans' or 'Dravidians', but only Indians for millennia. If this is realised, the occurrence of the so-called Āryan names in the Proto-Indian inscriptions should cause no surprise as they can be interpreted as Dravidian ethnic and linguistic elements surviving in the Indo-Āryan languages.

7. The priest-rulers of the Acropolis turn out to correspond to the Kuru clan; the mountain-people of the Lower City are the Pāṇḍus. If these correspondences are established, the Great Bhārata War can be viewed as the Proto-Indian civil war between the ruling and the working Classes. The victory of the latter spelt the end of the Proto-Indian polity and the dispersal of the population. It is quite likely that when the Āryans came in, they found Mohenjodaro and Harappa already in ruins and deserted, or. at best, occupied by the victorious but ill-organized 'mountain-people'. Indra may yet get the benefit of doubt and be acquitted!

8. The strongly-held traditions of the Chēra-Chōḷas of their connection with the Kauravas and the claim of the Pāṇḍyas to be related to the Pāṇḍavas receive dramatic confirmation in the seal-texts. In the light of this new evidence, we have to hold that the Kurus and the Pāṇḍus were originally Dravidian clans and became 'Āryanised' as they stayed on in the Pāñcāla and the Doab regions. The *Mahābhārata* even in its earliest version must have been no more than a legendary chronicle of the happenings of a very distant past. In this respect the *Mahābhārata* resembles the old Tamil traditions of the First and the Second Sangam Ages (Harappan and Saurashtrian phases?) of an equally remote past. Both the traditions meet in the cities of Mohenjodaro and Harappa.

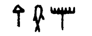
9. The Chedis seem to be connected with the priest-rulers while the Vatsas (a literal translation of Dr. **eḷa* : yong) are related to the City People. The story of Iḷa, the legendary ancestor of the Kuru-Pāṇḍu races and the legend of Kuśa found in Sanskrit sources appear to be referring to Iḷaṅkōcar, the mountain-people dwelling in the Lower City.

10. The Yādavas are in a special category. They are considered to be non-Āryan even in Sanskrit literature. They are connected with the priest-rulers. This confirms the strongly-held tradition of the Tamil Vēḷir that they were Yādavas and migrated from Dvārakā to the Tamil country.

11. The decipherment of the inscriptions has cleared up some of the mystery surrounding the Proto-Indian religion. I have so far found no evidence for a 'Proto-Śiva' or a 'mother-goddess'. The Finnish interpretation of some symbols as 'Śiva' (Mars) and 'Mother Goddess' has been shown to be incorrect. The religion of the Proto-Indians may be considered under two separate categories :

(*a*) *astral religion* : The names of the two priest clans indicate the existence of an astral religion primarily based on the worship of the serpent-planets (Skt., *rāhu* and

ketu). The pipal tree was sacred as its name was most probably homophonous with the word for 'serpent'. The later Dravidian serpent-worship seems to be derived from the worship of the serpent-planets. The names of the priests indicate the worship of Saturn and Venus also. Though the names of the other planets are not found, we may reasonably presume that the Proto-Indian worshipped all the planets known to the ancients. The *Navagraha* worship is still a part of Hinduism.

(*b*) *ancestor-worship* : The apotheosis of the 'Great Priest of the Vēḷir' as Viṣṇu-Kṛṣṇa and the 'Chief of the Kōcar' as Murukaṉ-Kumāra seems to have originated in ancestor-worship. The Harappan votive texts have most often two trigrammes. The trigramme  may stand for the Great Priest-Chieftain or 'Viṣṇu' (Ta. Neṭu Vēḷ). The trigramme represents an 'Iḷa' Chieftain of the common people. It may also stand for the 'young god' or 'god of the young' (Murukaṉ=Kumāra). Considering their contemporaneity in the Proto-Indian civilization it is not surprising that both the deities have common attributes: both claim the title *neṭu* and both compete for a place on the same hills! Murukaṉ is sometimes referred to as a Vēḷ (Priest). A careful study however reveals that each represents one of the two fundamental divisions of the Proto-Indian polity. Evidence is, however, not quite clear whether their apotheosis took place within the Proto-Indian civilization or in later Hinduism. The location of the temple of Viṣṇu to the west of the village seems to be a Proto-Indian survival.

12. And finally we come to the question whether there was a Dravidian civilization in South India before the migration of the

Proto-Indian people. No evidence has so far turned up proving the presence of the 'Dravidian' in the Deccan and the Peninsula earlier than the First Millennium B.C. The appearance of the iron-using people is sudden and intrusive. It may well be that the Proto-Indians retreating before the Āryan advance brought the Dravidian civilization for the first time to South India, and the indigenous neolithic people became completely merged with the Dravidians linguistically. By combining the new evidence with Sanskrit-Tamil traditions, we can reconstruct the story of the migration. After the destruction of the Proto-Indian Cities in the Great Civil War the Proto-Indian rulers continued to hold on to power in the Doab around the Mathurā until they were evicted by the relentless pressure of the Āryan princes. They then retreated to the Saurashtra coast where the Proto-Indian civilization was already declining. This last post also fell after a civil war. The Yadu-Vēḷ people then migrated to the South where they established the historical Dravidian civilization.

EXCURSUS A : THE HISTORY OF THE VĒḶIR :

The history of the Vēḷir can be briefly considered in two parts :

(*a*) The Vēḷir in the Tamil Country.

(*b*) The identity of the Yadu and the Vēḷ tribes.

(*a*). The Vēḷir Society in the ancient Tamil country was organized in three tiers :

(1) The Vēntar : The crowned kings.

(2) The Vēḷir : The nobles, chieftains and generals.

(3) The Vēḷāḷar : The peasantry.

(1) *The Vēntar* : The Tamil polity of the Sangam Age was presided over by the ***Mū-Vēntar***, the three crowned kings belonging to the Chēra, the Chōḷa and the Pāṇḍya dynasties. The frequent phrase '*vēntar-um vēḷir-um*' represents the Kings and their Nobles.

It is, however, important to notice the special relationship of the Vēḷir with the Chēras and the Chōḷas to the exclusion of the Pāṇḍyas. At the beginning of the period portrayed in the Sangam Age, the Vēḷir Chieftains are found only in the service of the Chēra-Chōḷa kings and not under the Pāṇḍyas. The Vēḷir women were given in marriage only to the Chēra-Chōḷa princes and not to the Pāṇḍyas. In fact, there is some evidence that a Vēḷāḷa clan of the Pāṇḍya country was persecuted by a Pāṇḍya king for refusing to give one of its maidens in marriage to the Pāṇḍya prince (Ramanathan, BSOAS, XXII-2, 1969, pp. 323–43). The Vēḷaikāra-p-paṭai, the fighting arm of the Vēḷir never served under the Pāṇḍyas. The Vēḷir and the Chēra-Chōḷa kings shared common names like Ātan̲, Kaṇṭan̲, -mān̲ etc., not found in the Pāṇḍya line. There is little doubt that the Chēras and the Chōḷas belonged to the Vēḷir stock and presided over a large confederacy of Vēḷir Chieftains. The Chēras and the Chōḷas fought with each other and the Vēḷir for supremacy. There was, however, a much deeper hostility between the Vēḷir and the Kōcar, the latter having the same special relationship with the Pāṇḍyas as the Vēḷir had with the Chēra-Chōḷas. The Kōcar had no scruples in serving under the Chēra-Chōḷas as palace-attendants and bearing arms for them. This state of affairs can be explained only by assuming that the Vēḷir considered themselves superior to the Kōcar in the social scale (*vide* Excursus B on the Kōcar).

(2) *The Vēḷir*: The Vēḷir clans occupied almost the entire length of the west and the east coasts except for a length on the South-East coast where the Pāṇḍyas had an outlet to the sea. They established large and flourishing ports like Musiri and Tōṇdi on the west coast and Cōpaṭṭin̲am, Vīrai (Arikamedu) and Kavirip-paṭṭin̲am on the east coast. The Chēra-Chōḷa prosperity was largely based on sea-borne trade. The Vēḷir were divided into numbered ' groups, almost certainly exogamous phratries. While the numbers mentioned in the poems range from 5 to 21, it is possible that the number of phratries was only seven, and the higher numbers were derived in later times by merely adding up

the numbers of these phratries. The Vēḷir were also divided into two clans, the Āy (Āviyar) and the Ōy (Ōviyar). Raghava Iyengar does not mention the Ōy in his *Vēḷir Varalāṟu*. However, the similarity in names, their reported descent from the Nāgas and other circumstances make it almost certain that the Ōy was a Vēḷ clan like the Āy.

(3) *The Vēḷalar* : The Vēḷāḷar (lit., the 'men' of the Vēḷ) were what their name indicates. They were the peasants, men-at-arms and artisans working under the Vēḷir Chieftains. Naccinārk-k-iṉiyar specifically mentions that the Vēḷir had a right to the services of the Vēḷāḷar. He also describes the Vēḷir Chieftains as "those who lived by causing (the lands) to be ploughed" and the Vēḷāḷar as "those who lived by ploughing the lands". (Nacc. on *Tol. Poruḷ.*, 34). There is, however, no doubt that the Vēḷ and the Vēḷāḷar belonged to the same stock and the distinction was one of social status only. The six occupations of the Vēḷāḷar listed in the *Tivākaram* are: agriculture, animal husbandary, trade, bead-making, smithy and service to the 'twice-born'. The last-mentioned occupation has been interpreted by the medieval commentators as 'service to the brahmans'. This does not appear to be correct. As the right to the services of the Vēḷāḷar was exercised by the Vēḷir, it seems that the 'priests' to whom the Vēḷāḷar rendered service were none other than the Vēḷir. The *tiṉacariyai*, a treatise on the Vēḷāḷar castes mentions about their sacerdotal origin.

(*b*) The classic work on the migration of the Vēḷir and their external affinities still remains the *Vēḷir Varalāṟu* published more than half a century ago by M. Raghava Iyengar (Third Edition, 1964, Madras). I can do no better than to summarise the evidence collected by him :

(1) Iruṅkōvēḷ, a Vēḷir Chieftain is described as having been descended through 'forty-nine generations' from the Vēḷir who arose from the pitcher of a northern sage and ruled over Ṭuvarai of the 'soaring bronze walls' (*Puṟam.*, 201).

(2) It is said that Agastya led a **migration of eighteen** kings descended from Neṭu-muṭi-aṇṇal (=**Kṛṣṇa**= Viṣṇu) and eighteen families **of Vēḷir from Tuvarāpati** (=Dvārakā) to Potiyil (somewhere **in the Tamil** country) (Nacc. on *Tol.*, *Pāyiram* : ***Poruḷ.***, **34**).

(3) The story of the origin in the pitcher of **a sage is also** shared by the Chalukyas who are **enumerated in the** Tamil nikaṇṭus as among the Vēḷir **Chieftains**.

(4) Iruṅkōvēḷ is addressed as the ***Puli-kaṭi-māl*** (**lit., the** hero who slew the tiger) (*Puṟam.*, 201–2). **This story** is shared by the Hoysalas who also styled themselves as Baḷḷāḷa (Ta. Vēḷāḷa).

(5) According to the Tamil tradition the Vēḷir migrated to the Tamil country from Koṅkaṇam and the Tuḷu territories. The evidence of place-names and related dynasties indicates that at one time the Vēḷir were spread throughout the Pañca-Drāviḍa territories comprising Gurjara, Maharashtra, Andhra, Karnataka and Tamil lands.

(6) There is clear evidence that the Vēḷir considered themselves as Yādavas. The Āykuḍi Plates specifically describe the Vēḷ Āy family as *Vṛṣṇikula* (T.A.S., 1, 12).

(7) The well-established connections of the Vēḷir with the Chalukyas and the Hoysalas and their claim of descent from the Yādavas link them up with practically all the famous dynasties of the South including Āndhras, Kadambas, Kākatiyas, Yādavas (Devagiri) etc.

(8) There is clear evidence in the Sanskrit sources that the Yādavas were regarded as 'inferior' to the Kṣatriyas. (I am adding the following to support this). **Śiśupāla** condemned Kṛṣṇa as '*varṇāśramakulāpeta*, i.e., one devoid of *varṇa*, *āśrama* and *kula* (the hallmarks of

Aryan birth) (*Bhāgavatam, Dasamaskandam*, 74 : 35). A revealing detail is the cross-cousin marriage in Kṛṣṇa's family (between Aniruddha and Rocanā), a totally non-Āryan and specifically Dravidian custom (Ibid., 61 : 25).

(9) The Yādavas migrated from Mathurā to Dvārakā on the west coast, (I may add, to escape the persecution of the Āryan princes like Jarāsandha and Śiśupāla), They did not, however, stay there long. A few years after the Bhārata War, a civil war broke out among the Yādavas in Dvārakā resulting in wholesale slaughter and probably migration. It appears from the evidence that the Yādava clan migrated South where they established the various leading kingdoms in course of time (R. C. Dutt, *Civilization in Ancient India*, Pt. I, p. 219).

Here ends the evidence collected by M. Raghava Iyengar. We have already seen that the historicity of the identity of the Vēḷ and the Yadu clans is confirmed by the decipherment of the Proto-Indian Texts.

EXCURSUS B: THE HISTORY OF THE KŌCAR :

The history of the Kōcar clans can be reconstructed from two separate sources :

(*a*) Old Tamil literature and inscriptions.

(*b*) Sanskrit literature.

2. The Tamil Sangam literature and temple inscriptions contain many references to the Kōcar. These have been collected and studied by R. Raghava Iyengar in his admirable monograph, *Kōcar : A Study* (Annamalai University, 1951). Dr. Dorai Rangaswamy has also dealt with the Kōcar and the allied tribes in his

work, *The Surnames of the Cankam Age, Literary and Tribal* (Madras University, 1968). I have freely drawn from these valuable studies though my interpretation of the facts proceeds on somewhat different lines.

3. According to Tamil tradition, the Kōcar entered the Tamil country from Koṅkaṇa and Tuḷu lands, a fact which immediately connects them with the migration of the Vēḷir from the same regions. The territories under the control of the Kōcar came to be known as Koṅku or Kō-nāṭu though the Kōcar clans were to be found throughout the Tamil country.

4. The Kōcar were divided into four groups and were generally described as *Nāṟ-Kōcar*, 'the Four Kocar'. These groups were almost certainly exogamous phratries.

5. The Kōcar are most often referred to as *Iḷaṅkōcar* or simply as *Iḷa(i)yar*. Raghava Iyengar has shown that the epithet *iḷam-* cannot mean 'young' when applied to a tribe which is also described as '*mutu kōcar* (the old or ancient tribe of Kōcar). We shall understand the significance of the term *iḷam* when we deal with the history of the Kōcar outside the Tamil country.

6. Another common epithet for the Kōcar is *moḻi*. This term has not so far been satisfactorily explained. However, the phrases *oṉṟu-moḻi-k-kōcar* and *nāṉ-moḻi-k-kōcar* occurring in the poems show that the term cannot mean 'the single (plighted) word' or the 'four dialects' supposedly spoken by the Kōcar. I suggest that the term *moḻi* is a corruption of *maḻu*, axe or sword, probably the totem symbol of the clan. This is confirmed by the frequently used epithet *vāy-vāḷ* ('sharp sword') before the names of the Kōcar. This identification connects the Kōcar with the Maṟavar or Maḻavar, and through them, with the Kaḷḷar or Kaḷavar. It appears that the Kōcar were divided into two totemistic clans, the *Maḻ-avar* ('axe' clan) and the *Kaḷ-avar* ('weed' clan). This division cut across the organisation of the tribe in four exogamous phratries.

7. The special relationship of the Kōcar with the Pāṇḍyas is alluded to very often in the Tamil literary works and inscriptions. The Kōcar formed the bulk of the Pāṇḍya fighting forces and produced the commanders, chieftains and nobles of the Pāṇḍya kingdom. It appears that the Pāṇḍyas themselves were of the Kōcar stock and presided over a large confederacy of Kōcar Chieftaincies, an exact parallel to the Chēra-Chōḷa leadeiship of the Vēḷir Confederacy. The existence of a Pāṇḍya line in the Tuḷu country, the earlier home of the Kōcar, is significant in this context.

8. The curious love-hate relationship of the Kōcar and the Vēḷir fills the pages of the old Tamil chronicles. They appear to have migrated together into the Tamil country, though retaining their separate identities. On the one hand, the Kōcar served the Chēra and the Chōḷa kings as palace attendants and fighting men side by side with the Vēḷir. The Kaḷḷar and the maṟavar clans in the Chōḷa country were known as Akam-uṭaiyār, a reference to the original occupation of these people as palace attendants in the Chōḷa kingdom. They are also mentioned as the palace-attendants of the Chēras in the *Kēraḷōlpatti*. The Kōcar also formed the famous army formations called the *teriñca kai-k-kōḷar paṭai*. (See Raghava Iyengar, *Kōcar*, pp. 55-57 for the identity of Kōcar and *Kōḷar*). The Chēra Commanders like Piṭṭaṉ and Koṟṟaṉ were also Kōcar Chieftains (PPTI, p. 563).

9. On the other hand, the Kōcar and the Vēḷir were implacably hostile to each other and missed no opportunity for a fight. Raghava Iyengar has collected a number of stories from the Sangam Works recording the wars of the Vēḷir and the Kōcar. One of the decisive bettles took place at Pāṟi in which Miñili, the Kōcar chieftain killed Veḷiyaṉ Vēṇmāṉ and drove off Naṉṉaṉ, both Vēḷir chieftains (*Akam.*, 208).

10. It can, therefore, be concluded that although the Kōcar served the Vēḷir faithfully, they maintained their separate identity and even asserted their independence. The bitter Chōḷa-Pāṇḍya wars

which dragged on for centuries and finally destroyed both the kingdoms were essentially the projection of the Vēḷir-Kōcar antagonism.

11. Raghava Iyengar has demonstrated the connection between the Vatsas of Kauśāmbī and the Iḷaṅkōcar of the Tamil chronicles. The term *vatsa* appears to be a literal translation of Ta. *iḷa*: young. According to the story in Rāmāyaṇa (I, 32), there was a king called Kuśa who had four sons, each of whom founded a kingdom. This can be interpreted as an allusion to the Four Phratries of the Kōcar. One of the sons of Kuśa founded Kauśāmbī (Pkt., Kosam). Kauśāmbī was called the Vatsa country and its famous king Udayaṇa was described as Vatsaraja. Even more significant is the story of *Iḷa*, the ancestor of the Kurus and the Pāṇḍus who were consequently known as the *aiḷa* or *aiḷava*. It appears that Iḷa (= Vatsa) and Kuśa of the Sanskrit legends and the Tamil Iḷaṅkōcar refer to the same people.

12. My investigations of the Proto-Indian texts place the story of the Kōcar in a new perspective which also confirms the essential truth underlying the Northern and the Southern legends. The possibility of Elam being the original home of the Iḷam-Kōcar has already been suggested.

SIGN-LIST (PART I) AND SELECTED READINGS FROM SEAL-TEXTS :

The following Table contains a list of 50 symbols which include almost all the basic signs of the script, with the exception of the numeral signs. I have, however, included four of the so-called ‘ numeral ’ signs which have ‘ non-numeral ’ functions (S. Nos. 7, 8, 31 and 32). I have not separately enumerated compound signs which consist of ligatures of two or more basic signs, *e.g.*, S. Nos. 1 and 3, 21 and 18 or 19, etc. The meanings of these compounds are easily derived from those of the component signs. Where modifications (as in the ‘ fish ’ series) or ligatures (as in S. No. 25)

substantially alter the meanings, these are enumerated separately. The signs given in the Table, along with their compounds and the 'numeral' signs account for nearly two-thirds of the total of symbol-occurrences. This shows how few are the basic signs in this script.

2. The reference numbers in Col. 2 of the Table are to the Sign Manual prepared by Gadd and Smith (M.I.C., III, Pl. CXIX–CXXIX) and followed by Vats (E.H., II, Pl. CV–CXVI). The reference numbers to the texts are from the original sources (*vide*, Bibliography). The symbols used in the texts are 'normalised' and may not always correspond to variants found in any individual text.

3. The system of transliteration and the standard abbreviations used in the Paper follow the *Dravidian Etymological Dictionary* (D.E.D.).

4. A word of explanation is necessary as to the method of phonetic transcription of the signs adopted in the Paper. It is, of course, not possible to determine the 'real' form of any Proto-Indian word, as the script is logo-graphic. The phonetic transcription of each symbol is to be regarded as a 'formula' indicating the phonetic boundaries within which the word occurs in the Dravidian languages. Thus the 'fish' symbol is 'read' as **mī̆ḷ/ṇ/ṭ-(v)*; (*m*=*v*; *i*=*e*). This means that the symbol can be interpreted with reference to the later forms like *miḷ-*, *mīḷi*, *vē̆ḷ-i* etc. This example also illustrates the fact that we cannot always get at the Proto-Indian form by reconstructing to the Proto-Dravidian form. The Dravidian 'fossil' words *mleccha* (<**miḷ-ey*) and *dramiḷa* (<**tiṟa-miḷ-a*) preserved in early Sanskrit literature make it likely that the Proto-Indian word for the priest-ruler was pronounced **miḷ-*. Now the method of historical parallels has established that the corresponding word in old Tamil was *vēḷ*, a result which cannot be reached by PDr. reconstruction. A combination of linguistic and historical parallels is thus essential for an interpretation of the script.

5. Translation of the Proto-Indian inscriptions presents similar problems. A literal translation of the proper names and titles will in fact be misleading. In the Indian context, there is a world of difference between the translation of, say, the pair of 'modified' fish symbols as 'Saturn-Venus' or 'Black-White' (as proposed by the Finnish scholars) and '*Mā Vēḷ*' (as proposed by me). *If the 'Conch' and the 'City'* symbols are literally translated, we shall miss the great significance of the terms *viz.*, their Northern association with the Kuru-Pāṇḍu Clans and their Southern association with the Vēḷir (Chēra-Chōḷa) and the Kōcar (Pāṇḍyas). Here again only a combination of linguistic and historical parallels will lead us to a true understanding of the Proto-Indian Inscriptions. It is for this reason that I have drawn attention to the corresponding old Tamil names and titles to aid comprehension. Such use is, however, to be understood as conventional and not indicating precise phonetic correspondences.

Note: For typographical reasons, the following changes are made in the system of transliteration used in the Sign List and the selected readings of Texts :

(1) *ṟ* for ṟ (DED)

(2) *a*(ă) etc., for ă etc., (DED)

SIGN-LIST OF THE PROTO-INDIAN SCRIPT (PART I)

Serial No.	Ref. No.	Sign	Approximate phonetic value	Object represented	Meanings	Dravidian and other Parallels (linguistic and historical) (Para Numbers refer to the Paper)
(1)	(2)	(3)	(4)	(5)	(6)	(7)
• 1	73		*vē(-ṅk, -nt)	A conventional representation of the Sun; to be hot as the Sun (DED. 4540).	(a) Deity (DED. 3635, 4550); (b) Temple (lit., place of the Deity), when followed by suffixes; (c) High-Priest, Priest-King, God-King.	1. Deity: Ta. *pēy* (DED. 3635); Kui. *vēnu* etc., (DED. 4550); 2. Place: Te. *Vēngi*: the country of the Eastern Chalukyas; the Capital of the Sālaṅkāyanas; Ta. *Vaikai* (<**Vēkay*?): a river; 3. King, Priest: Ta. *vēntaṉ* (DED. 4549), *vētiyaṉ* (Ta. Lex). (also see S. No. 20). (Paras 3.8—3.10).
2 (a) (b)	65 114	 	*cu(ū)r/ṛ/ṟ-(v) (c=k, ϕ)	A conch; to be curved (as a conch): DED. 2211, 2223, 2238.	(a) A 'surrounding' place, fortified capital, place about the palace, etc. (DED. 588); hence, the Acropolis or Citadel in the Proto-Indian Context. On the Citadel, see Wheeler, 1966, pp. 14, 28. (b) 'Surrounding' persons; *viz.*, counsellors, ministers; officials, priests, nobles, attendants, guards (DED. 646, 2238).	1. Place around a palace: Ta. *uṟi*, *uṟai*; (DED. 588). 2. Attendants at temples and palaces: Ta. *ūṟiyar* (DED. 646). 3. Attendants of the King: Ta. *cuṟṟam* (DED 2238). 4. Official Bodies: Ta. *kuṟu* (DED. 1513). 5. Derived names: *Cōṟa*: lit., the 'surrounding' attendants; the Chōḷas; Kuru>Kaurava: the dynasty which lost the Mahābhārata War. (Paras 3.11, 3.12, 3.16, 3.17).

SIGN-LIST OF THE PROTO-INDIAN SCRIPT (PART I)—(*contd.*)

Serial No.	Ref. No.	Sign	Approximate phonetic value	Object represented	Meanings	Dravidian and other Parallels (linguistic and historical) (Para Numbers refer to the Paper)
(1)	(2)	(3)	(4)	(5)	(6)	(7)
3 (*a*) (*b*)	78 120	 	**pār/ṇ/ṭ-(r)*	Plan of a city ; plan, order : DED. 3384. City : DED. 3383, 3347.	(*a*) The City. (*b*) The 'Lower' or 'Outer' City of the common people. (*c*) Citizens, townsmen, ordinary people.	1. Ka., *pāri* : order, row (DED. 3384). 2. Ta. *pāri*, *pāṭi* : city (esp. of the Vēḷir) ; (DED. 3383, 3347). 3. Ta. *Pāṇṭiya*, *Paraiya* : the Pāṇḍyas (lit., the city people). 4. Skt. Pāṇḍu> Pāṇḍavas : the heroes of the *Mahābhārata*, also called the *Pauravas* (lit., the townsmen). 5. Skt. *Paṇi* : a Non-Āryan tribe : (Paras 3.13—3.17).
4	283 (i)		**aka (-t, -mp)*	Cross-roads enclosed at ends ; streets or living areas inside a fortified place ; inside : DED. 8.	(*a*) inside, within the Citadel. (*b*) residential areas within the Citadel. (*c*) persons living inside the Citadel.	Ta. 1. *akam*, *akampu* : inside place (DED. 8). 2. *akuppā* : an ancient fort. 3. *akampaṉ* : a name (lit., insider). 4. *akattiyaṉ* : a name (id.) (PPTI). (Paras 4.15, 5.10)
5 6	283 (ii) 125	 	**pura(-t, -mp)*	Cross-roads with open ends ; streets or living areas outside a fortified place ; outside : DED. 3554.	(*a*) outside the Citadel ; (*b*) residential areas in the Outer (Lower) City ; (*c*) persons living in the Outer (Lower) City, ordinary people.	Ta. 1. *puṟam*, *puṟampu* : outside (DED. 3554) ; 2. *puṟattavaṉ*, *puṟattiyaṉ* } outsider : 3. *puṟa-c-cēri* : suburbs ; Skt. *pura* : town (<Dr. *pura*). *Paurava* : townsmen ; Pāṇḍavas. (Para 5.10)
7	1		*-*a*	A short stroke generally in the upper register ; a conventional sign ; phonetic value determined by positional analysis and from Dravidian parallels.	(*a*) possessive suffix ; (*b*) attributive or formative suffix.	1. TBI, 1966, 1968 ; for use of -*a* as possessive, attributive or formative suffixes. 2. Caldwell, pp. 296–300. (Para 3.5).

SIGN-LIST OF THE PROTO-INDIAN SCRIPT (PART I)—(*contd.*)

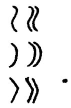
Serial No.	Ref. No.	Sign	Approximate phonetic value	Object represented	Meanings	Dravidian and other Parallels (linguistic and historical) (Para Numbers refer to the Paper)
(1)	(2)	(3)	(4)	(5)	(6)	(7)
8	2		*-*ir*-(*v*) (*r*=*l*=*n*)	Two short strokes mostly in the upper register; the sign indicates a homophone of *ir*-, 'two' (DED. 401).	(*a*) Locative-possessive suffix meaning, 'in, of, among'; (*b*) suffix for a place-name.	Ta. 1. *ir* : to live, to reside (DED. 407). 2. *il* : Locative suffix. A suffix for a place-name. 3. *iṉ* : Possessive suffix. (Para 3.4).
9	39		*-*ṭ*-	Two conventional strokes placed in the upper register; phonetic value determined by positional analysis and from Dravidian parallels.	Locative-possessive oblique case ending.	Ta. (*a*)*ṭṭ*-(*u*). (Para 3.5).
10	331		**mi*(*ī*)*ḷ*/*ṇ*/*ṭ*-(*v*) (*m*=*v* ; *i*=*e*)	A fish (DED. 3999).	(*a*) star or planet (DED. 3994); (*b*) epithet of priest-rulers meaning 'shining, glorious'; (DED. 3990, 3994, 4524). (*c*) A clan name for the priest-rulers by usage (DED. 4562).	1. O.Ta. names and titles : *miḷi*, *miḷai*, *miṭukkaṉ*, *miṭal*; (DED. 3970, 3990) (Ta. Lex., PPTI). 2. *vēṉ*, *vēḷ* : Chieftains with Northern and sacerdotal origins (DED. 4562). 3. *vēḷ*, *vēṇṭu* : 'sacrifice', to pray (DED. 4548, 4561). 4. *mleccha* : Skt., a Non-Āryan people; (Paras 2.10—2.16).
11	346		**vaḷ*/*ṇ*/*ṭ*-(*v*) (*a*=*e*)	A 'fish' with eaves, vault or sky above; eaves : DED. 4346, 4463; vault : DED. 4349; sky : DED. 4422.	(*a*) Venus, as the 'shining' planet (DED. 4524); (*b*) A personal name or title derived from (*a*); (*c*) A homophone for a man from the plains (?) : (DED. 4526); (*d*) A general name for a Priest-Ruler (DED. 4562).	O.Ta. names and titles : (*mā*-)*vaḷ*, *vaḷḷal*, *vaḷḷuvaṉ*, *vaḷavaṉ*, *veḷiyaṉ*, *veḷi* (*māṉ*); (Ta. Lex., PPTI). (Paras 2.29—2.30).

SIGN-LIST OF THE PROTO-INDIAN SCRIPT (PART I)—(*contd.*)

Serial No.	Ref. No.	Sign	Approximate phonetic value	Object represented	Meanings	Dravidian and other Parallels (linguistic and historical) (Para Numbers refer to the Paper)
(1)	(2)	(3)	(4)	(5)	(6)	(7)
12	341		**mā-y*	A 'fish' with horns; horned beast: DED. 3917; sharp, grow sharp: DED.3779.	(*a*) Saturn as the 'dark' planet (Ta. Lex.); dark: DED. 3918, 3927; (*b*) A personal name or title derived from (*a*); (*c*) An epithet meaning 'chief, noble, official', as in *kōyil mā-k-kaḷ* (PPTI); (DED. 3923).	1. Pre-fixed epithet as in *mā vēḷ* (*Puṛam.* 24). 2. Suffixed epithet as in *vēṇ mā-ṉ* (*Akam.* 36). 3. names as in *māl*: great man, Viṣṇu; *māyavaṉ*, *māyōṉ*: Viṣṇu, Kṛṣṇa (DED. 3918). (Paras, 2.26—2.28).
13	344		**cō-*	A 'fish' with a vertical stroke; to ascend: DED. 870; to emerge, as sun and moon: DED. 2344.	(*a*) Ascending node (Skt. Rāhu). (*b*) to drive off (exorcise?): DED. 2351. (*c*) demon, spirits: DED. 2346. (*d*) a priest: DED. 874. (*e*) a member of one of the two clans of the Proto-Indian priest-rulers (named after the ascending node).	Names associated with *ō-y* (<*cō) clan; place-names: *Ōymā-nāṭu*, *Ōmāmpuliyūr*, *Cō-paṭṭiṉam*; clan-names: *Ōy māṉ*, *Ōvi*, *Ōviyar*; (*Ciṟupāṇ*; PPTI). (Paras, 2.32, 2.33).
14	388		**cāy*	A 'fish' with a slanting stroke; slant, declivity: DED. 2026.	(*a*) Descending node (Skt., Ketu); (Ta., *Cāy kōḷ*), Ta. Lex. (*b*) to cause to leave (exorcise?): DED. 2028. (*c*) a member of one of the two clans of the Proto-Indian priest-rulers (named after the descending node.	Names associated with the *Ōy* (<*cāy) clan:- *Ā-ay*, *Āy*, *Āvi*, *Āviyar* (PPTI). (Para, 2.34).

Serial No.	Ref. No.	Sign	Approximate phonetic value	Object represented	Meanings	Dravidian and other Parallels (linguistic and historical) (Para Numbers refer to the Paper)
(1)	(2)	(3)	(4)	(5)	(6)	(7)
15	89		**kūṭ-(v)*	Two overlapping circles representing association, a clan or tribe (DED. 1562).	S. No. 15 : a general symbol for a clan of the priest-rulers.	Ta. *kūṭṭam, kūṭṭar* : clan, tribe (DED. 1562).
16	90		**cō-kūṭ-(v)*		S. No. 16 : The Clan of the Ascending Node.	cf. S. No. 13.
17	91		**cāy-kūṭ-(v)*		S. No. 17 : The Clan of the Descending Node.	cf. S. No. 14. (Para, 2.42)
18	238		**-(a)nr-(v)*	A vessel (DED. 107, 109, 110).	(*a*) Masc. sing. pronom. affix of Third Person ; (DED. 1). (*b*) a pronom. honorific affix for male personal names and titles ; (*c*) personal or clan names derived from honorific usage.	1. DED. 1 for words meaning 'he, that man', Ta., *aṉ* ; 2. DED. 111 for words meaning 'male'. 3. O.Ta. honorific affix *-antai-* (TBI., 13, 25, 65, etc.). 4. personal or clan names : *antiraṉ* (*puram.*, 129) ; *antar* (*Akam.*, 159) ; *aṇḍira* (Skt.) ; *āndhra*. (Paras, 1.17—1.22).
19	159		**-ey*	An arrow or a spear-head ; cf. E.H., II, Pl. CXXIII ; To discharge as an arrow, to throw as a spear, (DED. 691).	(*a*) epicene (?) nominal suffix ; (*b*) Personal or clan names derived from the nominal suffix.	1. Ta. nominal endings, *-i, -ai* ; 2. O.Ta. paragogic suffixes *-i, -iy, -y* after nouns ending in *-i, -ai* ; (TBI., 1, 2, 3, etc.). 3. O.Ta. personal or clan names : *Evvi* (*puram.*, 24) ; *Eyinaṉ* (*Akam.*, 181). (Paras, 1.37—1.39).
20	395, 396		**vē-y/(n)ṭ-(v)*	A personage with a club (bamboo staff or reed) on his shoulders ; a person in authority ; bamboo : DED. 4514, 4559.	(*a*) A priest-ruler occupying high position ; (*b*) The High-Priest or Priest-King (particularly when preceded by three short strokes in the upper register) ; (*vide* S. No. 1).	Ta. 1. *vēntaṉ* : 'crowned' king (DED. 4549 PPTI). 2. *vēttiya-* , of the King (Ta, Lex.) 3. *vētiyaṉ* : High-Priest, brahman (Ta. Lex.) 4. *mēti* : buffalo-faced demon, yama (Ta. Lex.) (cf. S. No. 1). (Paras, 2.50—2.55).

SIGN-LIST OF THE PROTO-INDIAN SCRIPT (PART I)—(*contd.*)

Serial No.	Ref. No.	Sign	Approximate phonetic value	Object represented	Meanings	Dravidian and other Parallels (linguistic and historical) (Para Numbers refer to the Paper)
(1)	(2)	(3)	(4)	(5)	(6)	(7)
21	386		**poṟ-(v)*	A personage with a pole across his shoulders carrying suspended loads at either side; burden : DED. 3729.	(*a*) A person carrying the 'burden of office' or responsibility; an official; holder of seal (of office). (*b*) A priest-ruler attached to the Temple or Palace for performance of specific duties (DED. 3728, 3729).	Ta. 1. *poṟuppu* : responsibility. 2. *poṟi* : responsibility, seal (of office), (DED. 3728, 3729). 3. *poṟaiyaṉ* : 'sustainer'. 4. *poṟaiyāṭṭi* : Priestess attached to a temple (Ta. Lex.) Kod., *poṟḍi* : to undertake an office (DED. 3729). O.Ta. *Poṟai*, Poṟaiyaṉ, *Poṟaiyar* : members of the junior branch of the Chēra royal dynasty : (TBI., 1966, 1968, Nos. 56–57). (Paras. 4.18—4.20).
22	383		**ka(ṇ)ṭ-(v)*	A personage with 'horns'; cf. 'horned' male animals : DED. 935, 943.	A honorific for a warrior, hero, noble, or chieftain DED. 986.	Ta. 1. *kaṇṭaṉ, kaṇa-v-aṉ, kaṇ-āṉ, kaṇṇaṉ* (?): names and titles in old Tamil poems and inscriptions. 2. *kaṇṭar, kavuṇṭaṉ* : caste-names among the Vēḷ-āḷ-ar. (Paras, 2.43—2.45).
23 (*a*) (*b*) (*c*)	19 20 26 184		**cara-y*	One or a pair of sinuous lines representing serpents; serpent : DED. 1949.	(*a*) Serpent-planets. (*b*) The clans of the priest-rulers named after the serpent-planets. (*c*) A member of the serpent-planet clans. (*d*) A honorific for the priest-ruler (DED. 167).	Ta. 1. *ara-* : snake (DED. 1949). 2. *aravar* : The Tamils (DED. 264). 3. *ara(i)yaṉ* : (DED. 167); *tara(i)yaṉ* : titles of the vēḷir chieftains. 4. Tira(i)yar : a Vēḷir-Nāga people in the north Tamil country (PPTI). (Paras, 2.39, 2.40, 2.46).

SIGN-LIST OF THE PROTO-INDIAN SCRIPT (PART I)—(*contd.*)

Serial No.	Ref. No.	Sign	Approximate phonetic value	Object represented	Meanings	Dravidian and other Parallels (linguistic and historical) (Para Numbers refer to the Paper)
(1)	(2)	(3)	(4)	(5)	(6)	(7)
24	256		**neṭ-(r)*	A toothed weapon generally with five prongs, prob., mounted on a shaft; cf. *neṭṭai*: a ('tall') weapon (Ta. Lex.).	An attribute meaning 'great' (lit., 'tall') prefixed to the names of deities and great personages; tall, great: DED. 3099.	Ta. *neṭiyōṉ*: name of a king (PPTI) Viṣṇu (DED. 3099). *neṭu-māl*: Viṣṇu. *neṭu-vēḷ*: Viṣṇu, Murukaṉ. *nēṭu-māṉ*: a king's name or title. *neṭu-miṭal*: ibid. (*vide*, PPTI). *neṭu-muṭi-aṇṇal*: Deity or King considered as the legendary ancestor of the Vēḷir at Tuvarāpati; equated with Viṣṇu-Kṛṣṇa (Nacc., on *Tol., Pāyiram*). (Paras. 2.47—2.49).
25	260		**paṭ-(v)*	Two weapons, indicating 'arms', armies; (Ta. Lex., DED. 3195).	Formations of Armed Guards.	Ta. *paṭai*: army formations; (*e.g.*) *nēṭai-p-paṭai kai-k-kōḷar paṭai.* (Paras. 4.36—4.38).
26	102		**iṛ-(v)*	Trunk (of body), to indicate 'waist' (symbol turned through 90° to the horizontal position); waist: DED. 380, 683; narrow, constricted: DED. 378, 447.	(*a*) Lord, Noble, Chieftain. (DED. 448). (*b*) a clan name of the Vēḷir by usage (DED. 382 ?). (*c*) The clan name '*Yadu*' (>Yādava) by usage.	Ta. 1. *iṟai. iṟaivaṉ*: Lord, Chief (DED. 448). 2. *iṭai*: a name of the ruling Vēḷir classes (to be distinguished from *iṭaiyar*: a low caste (cf. DED. 382). 3. *Yadu*: an epithet before the name *Valabhūti-y* (a typical Yādava name) on an Arikamedu graffito. Skt., *Yadu* (<**ed*), *yādava*: a non-Āryan tribe. (Paras. 4.2—4.5).

SIGN-LIST OF THE PROTO-INDIAN SCRIPT (PART I)—(*contd.*)

Serial No.	Ref. No	Sign	Approximate phonetic value	Object represented	Meanings	Dravidian and other Parallels (linguistic and historical) (Para Numbers refer to the Paper)
(1)	(2)	(3)	(4)	(5)	(6)	(7)
27	274		**cēr* (*-nt, -p/-v*)	A plough, a yoke; cf. Falkenstein, 214; yoke, plough: DED. 2313.	(*a*) A granary (Ta. Lex.); from *cēr*, to collect (DED. 2312). (*b*) A Keeper of the Granary (the Treasury in the Proto-Indian civilization); For the Great Granaries in the Cities, *vide*, Wheeler, 1966, pp. 18–21.	Ta. 1. *cēr, cē(r)nti*: granary (Ta. Lex.). 2. *Cēra*: the Chēras who ruled over *nāñcil-nāṭu*, the country of the Plough. 3. *Cē(r)ntan*: old Tamil name. 4. *Cērppan*: Chief of the maritime tract (Ta. Lex.). 5. *Cērvai*: Captain, Commander (Ta. Lex.). Skt., *Cedi*: a dynasty with non-Āryan associations; two of their princes were called Māvēla and Yadu; Balarāma, the Yadu Chieftain had the plough symbol (*Halāyudha*). (Paras, 4.6—4.9).
28	227 } 228 }		**kuṛ-(v)* (*ṭ<ṛ>ṭ*)	Mortar and pestle; to pound (as corn): DED. 1391, 1536, 1383; For mortar in the cities, *vide*, Piggott, 1950, pl. 3.	Pond, Pool: (DED. 1389); The Sacred Pool (The 'Great Bath'); Wheeler, 1966, pp. 16–17.	Ta. 1. *kuṭṭu*: to pound (DED. 1536). 2. *kuṭṭam, kuṭṭai*: Pond (DED. 1389). 3. *kuṭa-muṇi, kuṛu muṇi*: Agastya, who arose from a water-pitcher. 4. *kuṭṭan, kuṭṭuvan*: The Chēras (PPTI, Ta. Lex.). Skt. *kuṇḍa*: pit (of water or fire). (Paras, 4.10—4.16).
29	126		**poti-(k)-(v)*	A pillar set on a base; capital of a pillar: DED. 3746.	Pillared Hall, Assembly Hall, Palace; For the Pillared Halls in Mohenjo-daro, See Wheeler, 1966, pp. 17–18.	Ta. 1. *pōtikai*: capital of a pillar. 2. *Potikai, Potiyil*: residence of Agastya, a hill, a Vēḷir City, Hall of Justice, A common meeting place (even under a tree) for the Vēḷir and the Kōcar. (PPTI, Ta. Lex.). (Para, 4.17).

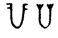
SIGN-LIST OF THE PROTO-INDIAN SCRIPT (PART I)—(*contd.*)

Serial No.	Ref. No.	Sign	Approximate phonetic value	Object represented	Meanings	Dravidian and other Parallels (linguistic and historical) (Para Numbers refer to the Paper)
(1)	(2)	(3)	(4)	(5)	(6)	(7)
30	293		**var-(v)*	A row or series of lines symmetrically placed within a rectangular enclosure ; line, row, series : DED. 4310. line, stripe, course : DED. 4304. boundary, enclosure : DED. 4301.	A scribe (DED. 4304) ; from, 'to incise' (DED. 4302, 4357).	Ta. *vari, varai* : to write (DED. 4304). Te. *rāyu, rāsu* : ibid. Ta. *vāriyaṉ* (inscr.) : A temple accountant (prob. a scribe) *mā-rāyaṉ* (inscr.) : A temple servant (prob. a scribe) (Ta. Lex.). (Paras 4.21—4.23).
31	6 (i)		**mu (ū)-(n) t-(v)*	Three short strokes in the upper register prefixed to S. No. 10 and S. No. 20 ; the sign indicates a homophone of 'three' (DED. 4147).	An attribute meaning 'first, chief, head, principal, senior', etc., (DED. 4053, 4057).	Ta. 1. *mutal* : first, principal (DED. 4053). 2. *mutu, mutt- mūtta* : elder, senior, great (DED. 4057).
32	6 (ii)		**mu(ū)-nṟ-(v)*	Three long strokes suffixed to S. No. 28 ; the sign indicates a homophone of 'three' (DED. 4147).	A noun meaning, 'chief, head, leader, master, commander, etc.' (DED. 4119).	Ta. 1. *muṉpaṉ* : leader, master ; 2. *muṉaiñaṉ* : commander (DED. 4119). 3. *muṉaiyar* : one of the eighteen groups of Veḷir who accompanied Agastya on the Southern migration. (Compare S. No. 31 and 32). (Paras, 2.20, 2.55, 4.14).

SIGN-LIST OF THE PROTO-INDIAN SCRIPT (PART I)—(*contd.*)

Serial No.	Ref. No.	Sign	Approximate phonetic value	Object represented	Meanings	Dravidian and other Parallels (linguistic and historical) (Para Numbers refer to the Paper)
(1)	(2)	(3)	(4)	(5)	(6)	(7)
33	436 } 437 }		**viḷ/ve(ē)ḷ-(r)*	Right forearm with all the fingers spread out; (right palm faces the reader with the thumb at the right end); open, expand: DED. 4459, 3446.	A numbered Formation of Attendants or Guards known as 'the Open Right Hand Formation'; stationed within the Citadel; attached to the Temple, the Palace and the Army; members belonged to the ruling Priest class.	Ta. cf. *valaṅkai* (Right Hand) *vēḷa(i)-p-paṭai* (Vēḷai Regiments); the famous elite corps of bodyguards and armed formations of the Chōḷas; a large number of the regiments known from inscriptions; they lived in separate cantonments (*vēḷam*); they were sworn (*terinta*) to defend the person of the King with their lives; prob., connected with the Vēḷir and the Right Hand Castes. *Vide*, ***The Cōḷas***, II(i) pp. 217–30. (Paras 4.24—4.34).
34	441		**ko(ō)ḷ*	(Left?) forearm with the fingers kept close together; to hold, grasp: DED. 1788.	A numbered Formation of Attendants or Guards known as 'the closed (Left?) Hand Formation'; stationed within the Citadel; attached to the Temple, the Palace and the Army; members belonged to the 'mountain-people' of the Lower City.	Ta. ***kai-*** (Hand) ***-k-kōḷ(-ar)*** ***paṭai***; ***kai-*** (Hand) ***mā cēṉai*** (great army); the famous elite corps of attendants and armed formations associated mostly with the Pāṇḍyas, but also serving under the Chōḷas; they were sworn (***terinta***) to defend the person of the King with their lives; Prob., connected with the Kōcar and the Left. Hand Castes; ***Vide***, ***Kōcar***, pp. 55–58. (Paras 4.24—4.34).
35	69		**viḷ/ve(ē)ḷ +aka-*	'Open Right Hand' within an enclosure; inside: DED. 8.	Cantonment or barracks for the 'Open Right Hand' Formations of Attendants and Guards.	Ta. ***vēḷam***, ***vēḷakam*** (inscr.) ***viḷākam*** (DED. 4462): Quarters of the Vēḷai Regiments (The ***Cōḷas***; op. Cit.). (Para 4.31).

SIGN-LIST OF THE PROTO-INDIAN SCRIPT (PART I)—(*contd.*)

Serial No.	Ref. No.	Sign	Approximate phonetic value	Object represented	Meanings	Dravidian and other Parallels (linguistic and historical) (Para Numbers refer to the Paper)
(1)	(2)	(3)	(4)	(5)	(6)	(7)
36	68		***ko(ō)ḷ +aka-**	'Closed (left?) Hand' within an enclosure; inside: DED. 8.	Cantonment or barracks for the 'Closed (Left?) Hand' Formations of Attendants or Guards. For cells (barracks?) in the Citadel, see Wheeler, 1966, pp. 16–17.	Interpreted by analogy with S. No. 35. (Para, 4.31).
37	43		***tiṛ-/te(ē)ṛ-(v)**	Prob. an open door; cf. Sumerian '*bad*: 'open'; M.I.C., II, p. 454, No. 15; 'to open': DED. 2667.	Faithful, trustworthy; attribute prefixed to the priest ('fish' sign) and the 'Open Right Hand' and the 'Closed (Left?) Hand' Formations, sworn or dedicated to the service of the Temple.	Ta. 1. *tēṛṛu*: to swear, take an oath; ***tērunar***: trustworthy persons; ***tēriṉar***: tested friends (DED. 2856, 2836). 2. *terinta, teriñca* (inscr.): attribute to the Vēḷai and Kōḷar regiments 'sworn to fidelity'. 3. *tēr*: attribute to names as in ***tēr-vēḷ*** (*Puṟam.*, 133). 4. **tiṛ-miḷ*>*tamiḻ*, ***drāviḍa***. (Paras, 4.32—4.34).
38	232+		***viḷ/Ve(ē)ḷ-anṛ**	Two upraised hands with fingers open; +pron. suffix.	A Chieftain or Commander of the 'Open Right Hand' Formations of Attendants or Guards.	Ta. 1. ***vēḷ-āṉ***: A ***vēḷ-āḷ-ar*** Chieftain. 2. ***mū-vēnta-vēḷāṉ***: ibid., Ka. ***paḍe vaḷḷa:a*** general (DED. 3195). (Paras, 4.35—4.38).
39	236+ 237+ }		***ko(ō)ḷ+anṛ**	Two upraised hands with closed palms; +pron. suffix.	A Chieftain or Commander of the 'Closed (Left?) Hand Formations of Attendants or Guards.	cf. ***kai-k-kōḷ cēnāpati***(S.I.I., V, 418). (Paras, 4.35—4.38)

SIGN-LIST OF THE PROTO-INDIAN SCRIPT (PART I)—(*contd.*)

Serial No.	Ref. No.	Sign	Approximate phonetic value	Object represented	Meanings	Dravidian and other Parallels (linguistic and historical) (Para Numbers refer to the Paper)
(1)	(2)	(3)	(4)	(5)	(6)	(7)
40	370+		**anṛ-a(ā)ḷ/ṉ*	The symbol of an 'ordinary **man**' (*servant*) suffixed to the pron. honorific; the di-gramme is a single word.	The Class of Attendants to the Priests; belonged to the Priest-Ruler group; prob. furnished men for the various 'Open Right Hand' Formations	Ta. 1. *vēḷ-āṉ, vēḷ-āḷ, vēḷ-āḷ-ar*: men in the service of the Vēḷir (Excursus A). 2. *ant-aṉ, ant-aṉ-aṉ, ant-aṉ-āḷ-ar*: 'inferior' brahman (?) priests; prob. Priest-attendants (*vēḷ-āḷ-ar*). 3. *ant-aḷ*; *ant-aḷ-aka-tt-āḷ-ar*: attendants and warriors under the Chōḷas. 4. *āndhra-bhṛtya*: the 'servants-of-Āndhra, dynasty. (Paras. 4.39—4.47).
41	219		**kō-y*	A 'cup' mostly found on the votive objects at Harappa; preceded by one to four long strokes;	'Mountain-people' who lived in the Lower (Outer) City; ordinary, common people; were divided into four phratries and two totemistic clans;	Ta. 1. *kōy*: toddy tankard (*Puṟam.*, 300); (DED. 1842). 2. *Nāṟ-Kōcar*: The Kōcar of the Four Clans. 3. *kō, kuyava-*: potter clan (DED. 1468). (Paras. 5.1—5.5; Excursus B).
42	391		**eḷ-(v) +kō-y*	A figure of a squatting person ligatured to the 'cup' symbol; to raise oneself slightly: DED. 432.	The fuller name of the 'mountain-people'. The epithet **eḷa-* indicates the prob. origin of these people from Elam.	Ta. *Iḷaṅkō, Iḷaṅkōcar, Iḷavaṉ, Iḷa(i)yar*: Kōcar names. (Para. 5.14; Excursus B).
43	180		**eḷ-(v)*	A loose bow-string or rope; relax, loosen: DED. 433.	An attribute of the 'mountain-people';	ibid. (ibid.).

SIGN-LIST OF THE PROTO-INDIAN SCRIPT (PART I)—(*contd.*)

Serial No.	Ref. No.	Sign	Approximate phonetic value	Object represented	Meanings	Dravidian and other Parallels (linguistic and historical) (Para Numbers refer to the Paper)
(1)	(2)	(3)	(4)	(5)	(6)	(7)
44	96		**eḷ-(v)*	An infant; young, tender (DED. 436).	(*a*) A personal-cum-clan name occurring frequently among the mountain-people. (*b*) A Chieftain of the mountain-people. (*c*) Murukaṉ (Skt. Kumāra), the young god (god of the 'young ones'?). (*d*) Attribute to personal name, meaning 'young'?	ibid. (Para, 5.11—5.13).
45	157		**kō-y*	Three hills in a row; mountain: DED. 1811.	The 'mountain people' who were the commoners in the Lower City.	Ta. 1. *kō*: mountain; DED. 1811. 2. *ku(ū)/o(ō)-*: names of Dravidian hill-tribes (See Para 5.5 for list). 3. *kōcar*: the martial clans of the Pāṇḍya Kingdom; served also under the Chēra-Chōḷas (Excursus B). 4. cf. Malaya-dhvaja: Pāṇḍya name, Prob. referring to the 'hill emblem' of the dynasty at one time. 5. cf. the legend of the 'three breasts' of Mīnākṣi, the First Pāṇḍya Queen. (Paras, 5.6—5.7).
46			**aka-kō-y*	The 'hill symbol' within a frame. *aka-*: inside (DED. 8).	The mountain-people working within the Citadel.	Ta. cf. *akam-uṭaiyār*: Kaḷḷar and Maravar (Kōcar groups) working in royal households. (Para, 5.9) (Excursus B).
47	158		**puṛ-a-kō-y*	The 'hill symbol' modified with a short stroke on each peak; *puṛa-*: outside (DED. 3554).	The mountain-people working outside the Citadel *i.e.*, in the Lower City.	(Para 5.10).

SIGN-LIST OF THE PROTO-INDIAN SCRIPT (PRAT I)—(*contd.*)

Serial No.	Ref. No.	Sign	Approximate phonetic value	Object represented	Meanings	Dravidian and other Parallels (linguistic and historical) (Para Numbers refer to the Paper)
(1)	(2)	(3)	(4)	(5)	(6)	(7)
48	133 } 363		**maṛ-(v)*	Axe or knife fixed through a wooden handle; *vide* Diringer, 1968, II, p. 71 for a Hittite parallel; axe: DED. 3889.	Totem symbol of one of the two clans of the mountain-people.	Ta. *maṛ-u*: axe (DED. 3889); *maṛavar*, *maṛavar*, *moṛi-k-kōcar*: clan names. (Para, 5.8) (Excursus B).
49	263-*a*		**kaḷ-(v)*	Weed, clump; *vide* Hunter, p. 208 for an Egyptian parallel; weed: DED. 1157.	Totem symbol of one of the two clans of the mountain people.	Ta. *kaḷ-a*: weed (DED. 1157) *kaḷḷar*, *kaḷavar*: clan names. (Para, 5.8) (Excursus B).
50	268		**iṛ/iṭ-(v)*	Hand (without the arm) in a horizontal position; *vide* Falkenstein No. 9 for a close Sumerian analogy; to drop, fall, low: DED. 426.	Serf or slave, prob. drawn from the mountain people.	Ta. *iṛi*: low (DED. 426). Ma. *eṛava*: a low caste (serfs) in Kerala. Ta. *ēṛai*: a poor person (originally a slave?); (DED. 728). *eṛai-*: shepherd (TBI., 28). *iṭai*: ibid (DED. 382). (Paras, 5.18—5.21).

Plate No. I

SELECTED SEAL TEXTS

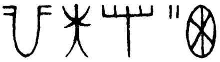
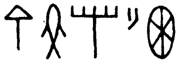
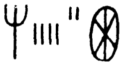
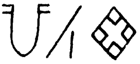
S. No. (1)	Ref. No. (2)		Texts (to be read from the right) (3)
1.	F.E.M., 168	..	
2.	M.I.C., 543	..	
3.	M.I.C., 76	..	
4.	M.I.C., 19	..	
5.	M.I.C., 246	..	
6.	M.I.C., 157	..	
7.	M.I.C., 285	..	
8.	M.I.C., 380	..	
9.	M.I.C., 261	..	

Plate No. II

SELECTED SEAL TEXTS

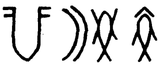
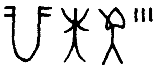
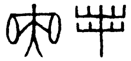
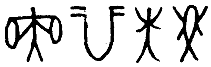
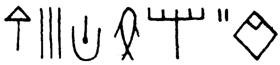
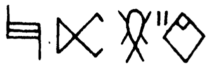
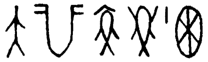
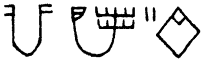
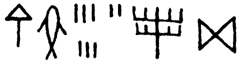
S. No. (1)	Ref. No. (2)	Texts (to be read from the right) (3)
10.	Lothal (IAR, 1957–58, XX, 7) ..	
11.	E.H., 33 ..	
12.	M.I.C., 268 ..	
13.	C.E., LII, 28 ..	
14.	M.I.C., H-95 ..	
15.	M.I.C., 345 ..	
16.	M.I.C., 94 ..	
17.	M.I.C., 96 ..	
18.	M.I.C., 456 ..	

Plate No. III

SELECTED SEAL TEXTS

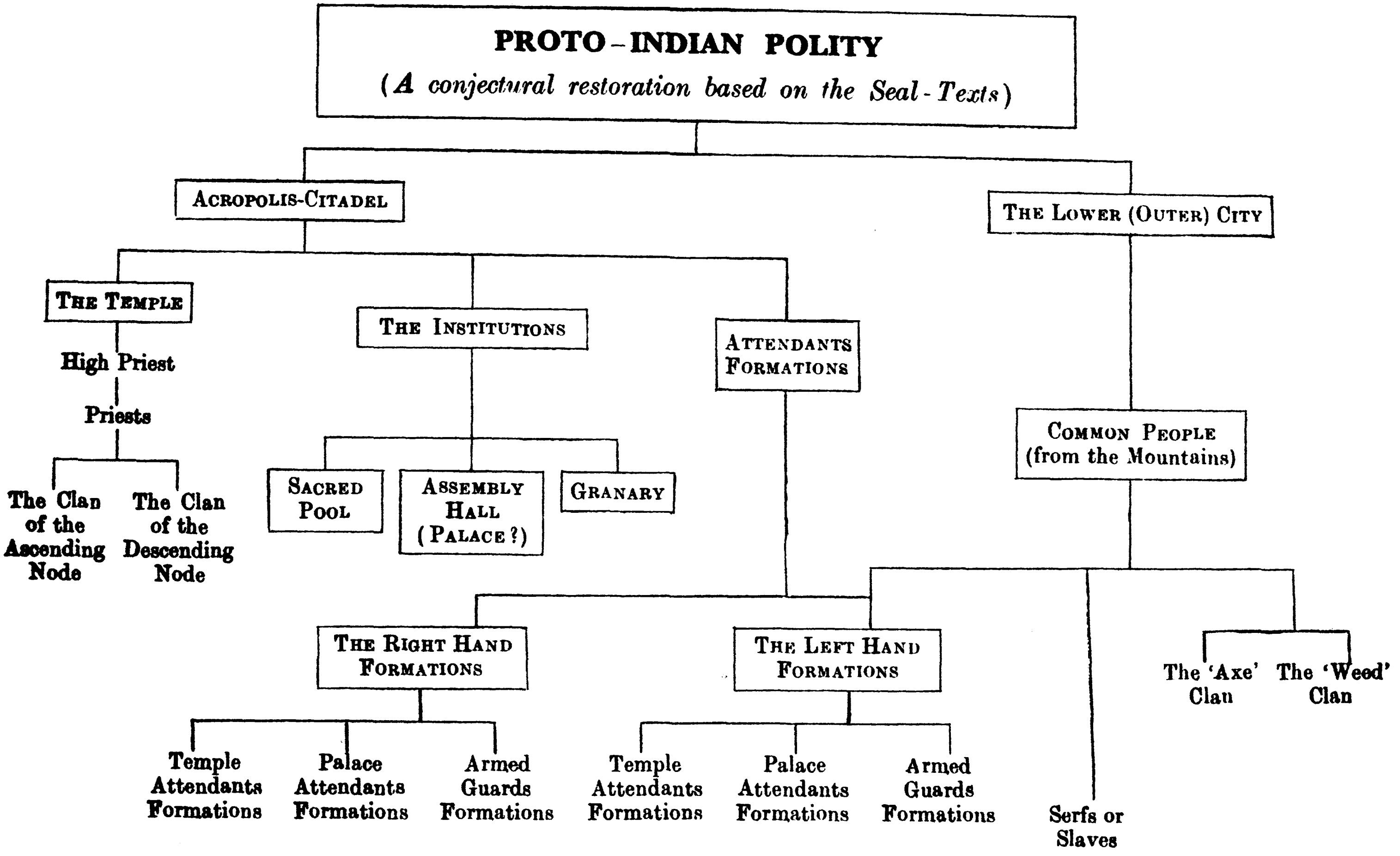
S. No. (1)	Ref. No. (2)		Texts (to be read from the right) (3)
19.	M.I.C., H-222	..	
20.	M.I.C., H-153	..	
21.	M.I.C., 109	..	
22.	M.I.C., 40	..	
23.	F.E.M., 65	..	
24.	M.I.C., H-72	..	
25.	M.I.C., 314	..	
26.	M.I.C., 201	..	
27.	E.H., (freq)	..	

TRANSLATIONS OF SELECTED SEAL-TEXTS

S. No.	TRANSLATION (the number within brackets placed immediately after a word refers to the order of the signs in the Texts counting from the right)
(1)	(2)
1	(The) Great (3) Lord (4)—he (5) of (2) (the) Temple (1). [cf. Ta., *Neṭ-(um) Kaṇṭ-aṉ* ; (3–4–5)]
2	(The) Great (3) Priest (lit., the shining one) (4)—he (5) of (2) (the) Temple (1). [cf. Ta. *Neṭ-u Vēḷ* ; (3–4)]
3	(The) Four(-th) (3) 'Closed (Left?) Hand' (4) (Formation of Attendants) of (2) (the) Temple (1). [cf. Ta. *Kai-k-kōḷ* ; (4)]
4	He (5) (of the) Four(-th) (3) (Phratry) (of the) Priest(-s) (4) in (2) (the) Citadel (1).
5	(The) Four(-th) (3) 'Open Right Hand' (4) (Formation of Attendants) of (2) (the) Citadel (1). [cf. Ta., *Valaṅkai vēḷai* ; (4)]
6	(The) Six(-th) (3) 'Closed (Left?) Hand' (4) (Formation of Attendants) of (2) (the) Citadel (1).
7	(The) 'Sworn (2)—he (3)' (of the) City (1). *Note* : the epithet 'sworn' seems to be used for persons dedicated to the Temple. The corr. Ta. (inscr.) word seems to be '*terinta*' (Paras, 4.28—4.34).
8	**Ve(ē)ḷ/ṇ-(v)* (a name) (1), he (3) (of the) (clan of the) Ascending Node (2). [cf. Ta., *Ve(ē)ḷ-i* (1) *Ō-y* (2–3)]
9	He (2) (of the) (clan of the) Descending Node (1). [cf. Ta. *Āy* (1) *Evvi* (2)]
10	**Ve(ē)ḷ/ṇ-(v) Mā* (a comp. name) (1–2), he (4) (of the) serpents-clan (3). [cf. Ta. *Vēṇ mā(ṉ)* or *Veḷi mā(ṉ) Aray-aṉ* ; (1–4)]
11	(The) High (1) Priest (2), Lord (3)—he (4). [cf. Ta. *Mū-vēnta-(k-)kaṇṭ-aṉ* ; (1–4)]
12	Officer (2) (of the) Army (1). [cf. Ta. *paṭai* (1) ; *poṟai* (2)]
13	Chief (1) Lord (2)—he (3), (an) officer (4). [cf. Ta. *Mā kaṇṭ-aṉ poṟai*, (1–4)]
14	(He) (of the) Six(-th) (3) (Phratry) (of the) Priest(-s) (4), (an) officer (5) in (2) (the) Temple (1).
15	**Ve(ē)ḷ/ṇ-(v)* (a name) (3) (of the) (clan of the) Descending Node (4), chief (6) -he (7) (of the) (Sacred) Pool (5) of (2) (the) Temple. [cf. *Vēḷ-Āy* (3–4) ; *Kuṟu-muṉ(a)i* (5–7)]
16	Great (3) Priest (4), Chief (6) —he (7) (of the) (Sacred) Pool (5) in (2) (the) Citadel (1).

TRANSLATIONS OF SELECTED SEAL-TEXTS

S. No.	TRANSLATION (the number within brackets placed immediately after a word refers to the order of the signs in the Texts counting from the right)
(1)	(2)
17	Chief (3) Lord (4) Granary (-Keeper) (*i.e.* Treasurer) (5) in (2) (the) Citadel (1). [cf. Ta., _Mā_ (3) _Iṟai_ (4) _Cēr(aṉ)_ (5)]
18	Lord (7) Granary (-Keeper) (6), Chief (5) (of the) (Sacred) Pool (4), (of the) (Clan of the) Descending Node (3) in (2) (the) Citadel (1). [_Note :_ This text indicates that the occupational names had become even then personal names by usage, and not always to be understood literally.]
19	Chief (3) Scribe (4) —he (5) of (2) (the) Inner Place (*i.e.* Citadel) (1). [cf. Ta. _akattu_ (1–2) _mā rāya-ṉ_ (3–5)]
20	Chief (1) Scribe (2) —he (4) (of the) Outer Place (*i.e.* the Lower City) (3). [cf. Ta., _Puṟattiyaṉ_ (3-4)]
21	*_Mā Ve(ē)ḷ/ṉ-(v)_ (a name) (3-4), (the) Priest-Attendant (5-6) of (2) (the) Temple (1). [cf. Ta., _Vē(nt)-a_ (1–2) _Mā Vēḷ_ (3–4) _ant-aḷ/ṉ_ (5–6)]
22	He (4) (of the) 'Open Right Hand' (Formation of Attendants) (3) (in the) Palace/Hall (2) (of the) Priest(-s) (1). [cf. Ta., _Vēḷ Potikai_ (1–2)]
23	(The) Commander—he (of the) Army (of the) 'Open Right Hand' (Formation of Attendants) (3–4) of (2) (the) Temple (1). [cf. Ta., _Paṭai Vēḷ-āṉ_ (3–4)]
24	(The) Commander—he (of the) Army (of the) 'Closed (Left?) Hand' (Formation of Attendants) (3–4) in (2) (the) Citadel (1).
25	He (6) (of the) Six(-th) (4) (Phratry) (of the) Priests (5) (a name), in (3) (the) Army (2) (of the) Lord (1). [cf. Ta., _Iṟai Paṭai -il aṟu miḷi (ve(ē)ḷ-i)_ (1–6)]
26	He (3) (of the) Axe (clan) (1) (of the) Mountain (-tribe) (2). [cf. Ta., _maṟ (-ava) kōca-ṉ_ (1-2-3).]
27	Offerings (6) (of) *_Eḷ-a anṟ_ (a name) (3–4), (_a_) serf (5), (of the) Third (1) (Phratry) (of the) *_Kō-y_ (a clan) (2). [cf. Ta., _mu (-k-) Kōcar_ (1–2) _Iḷavaṉ_ (3–4) _ēṟai_ (5) _kāṇikkai_ (6)] _Note :_ The inscription is on a three-sided votive object. Sign Nos. 1–2 are on the first side, 3–5 on the second side and 6 ("three eyes") on the third side; The signs on the third side represent 'eyes' and stand for 'offerings'. The related homophones are : _kaṇ-k_ : eyes (DED. 973). _kāṇ_ : to see, to show (DED. 1209). *_kāṇ-k_ (-_v_) : offerings to deity (ibid.).


PROTO-INDIAN POLITY
(A conjectural restoration based on the Seal-Texts)
ACROPOLIS-CITADEL
THE LOWER (OUTER) CITY
THE TEMPLE
High Priest
Priests
The Clan of the Ascending Node
The Clan of the Descending Node
THE INSTITUTIONS
SACRED POOL
ASSEMBLY HALL (PALACE?)
GRANARY
ATTENDANTS FORMATIONS
COMMON PEOPLE (from the Mountains)
THE RIGHT HAND FORMATIONS
Temple Attendants Formations
Palace Attendants Formations
Armed Guards Formations
THE LEFT HAND FORMATIONS
Temple Attendants Formations
Palace Attendants Formations
Armed Guards Formations
Serfs or Slaves
The 'Axe' Clan
The 'Weed' Clan

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(*vide* Bibliography for abbreviations used in citations)

[1] First Announcement, pp. 7; 19.

[2] Soviet Studies, p. 7.

[3] First Announcement, p. 19.

[4] M.I.C., II, p. 415 ; Hunter, pp. 59-60 ; Soviet Studies, p. 10 ; First Announcement, p. 19.

[5] Hunter, pp. 59–60.

[6] Soviet Studies, p. 19.

[7] Ibid., p. 10.

[8] First Announcement, p. 19.

[9] M.I.C., II, p. 438.

[10] Hunter, pp. 56–57.

[11] Ibid., pp. 27; 61.

[12] *Proto-Indica* : 1968, pp. 11–12.

[13] First Announcement, pp. 18–22.

[14] Heras, pp. 66–67.

[15] First Announcement, pp. 21–22.

[16] Soviet Studies, p. 21.

[17] Hunter, p. 55; p. 210, No. 1.

[18] Soviet Studies, p. 21.

[19] First Announcement, pp. 21–22.

[20] Heras, p. 67.

[21] Soviet Studies, p. 21.

[22] First Announcement, pp. 21–22 ; Further Progress, p. 6.

[23] Hunter, p. 60.

[24] Heras, p. 67.

[25] Further Progress, p. 6.

[26] Soviet Studies, pp. 20–21.

[27] M.I.C., II, pp. 415–22 (' Independent self-contained units' ; ' a succession of separate words '); Hunter, p. 128 : ' no sign of common occurrence, except (one), is not found as a single word '.

[28] TBI., No. 41 is not an exception as the epigraph is broken off after the genitive.

[29] *Dravidian Coins* (*The Pāṇḍyas and Chōḷas and their Coinage*), Rangachariar T. M., and Desikachariar, T. It is interesting that even Sanskrit coin-legends in the Tamil country end in the Nominative, the only known exception being the silver coin of Śrīvirakerala (*Coins of India*, Brown C. J., Pl. VII, 9). I am indebted to Miss R. Vanaja, National Museum, for the information.

[30] M.I.C., III, Pl. CVI, 93.

[31] Caldwell, R., pp. 296–300.

[32] TBI., 3, 6 (-*i*-) ; 26 (-*il*) ; 28 (-*iṉ*) etc.

[33] Cited, '*T.B.I.*' (*vide* Bibliography).

[34] *Caṅka Ilakkiyam*, II, pp. 1486–1502.

[35] Hunter, p. 210, No. 1.

[36] Ibid., pp. 56–57 ; 116–17.

[37] Soviet Studies, p. 21 ; First Announcement, pp. 18–19.

[38] Soviet Studies, p. 21.

[39] Hunter, pp. 116–17 ; Heras, pp. 258-259.

[40] First Announcement, pp. 22–23.

[41] Further Progress, p. 35.

[42] Soviet Studies, p. 10.

[43] First Announcement, p. 19.

[44] Hunter thought that the 'interior dot' represented the 'pupil of the eye'! However, many of the spear-heads recovered from the sites show one or two rivet-holes in the blade supporting my identification. See, E. H., II, Pl. CXXIII.

[45] Soviet Studies, p. 11.

[46] M.I.C., II, p. 408.

[47] Hunter, pp. 71-77.

[48] Heras, p. 261.

[49] Soviet Studies, p. 21 ; Proto-Indica : 1968, pp. 34 ; 42-44.

[50] *Proto-Indica* : 1968, pp. 40-42.

[51] First Announcement, pp. 40-44 ; Progress, pp. 18-20 ; 28-29, Further Progress pp. 9-10 ; 15-20.

[52] *Among the Gonds of Adilabad*, Sethu Madhava Rao Pagdi, 2nd. ed., Bombay (1949), p. 3.

[53] 'On the significance of the term *arma-*, *armaka-*, in Early Sanskrit literature', T. Burrow *Journal of Indian History*, XLI : 1, (1963), pp. 159-166.

[54] Hunter, Table XIII, Nos. 247-48.

[55] For a brief notice of the Ōy Clan, see '*The Surnames of the Caṅkam Age, Literary and Tribal*, Dorai Rangaswamy, Madras, (1968), pp. 139-142.

[56] For details of the Āy Clan, ibid., pp. 135-139. Also see, '*Vēḷir Varalāṟu*', M. Raghava Iyengar, 3rd ed., Madras (1964), pp. 38-49.

[57] For a brief notice of the Tiraiyar clan, see, Dorai Rangaswamy, op. cit., pp. 168-173.

[58] Hunter, p. 109 ; Table L.

[59] *Proto-Indica* : 1968, p. 15.

[60] Further Progress, pp. 11-12 ; 32.

[61] Ibid.

[62] Hunter, p. 128.

[63] Heras, p. 76 ; *Proto-Indica* : 1968, pp. 44-45.

[64] Progress, pp. 15-16.

[65] *Proto-Indica* : 1968, p. 15.

[66] Ibid., p. 21.

[67] Further Progress, p. 26.

[68] Hunter, pp. 83-86 ; 94-95.

[69] Heras, p. 74.

[70] Ibid., pp. 73, 86-87, 113.

[71] Ibid., pp. 97-98 ; texts 8 and 12.

[72] Progress, pp. 20-22 ; Further Progress, pp. 28-29.

[73] Further Progress, pp. 4-6.

[74] Heras, pp. 69, 81, 100.

[75] First Announcement, pp. 29-31 ; Further Progress, pp. 21-23.

[76] Ancient India, No. 2, (1946), p. 113, Fig. 47, No. 20.

[77] Heras, p. 260 ; First Announcement, p. 31.

[78] Falkenstein, No. 214.

[79] First Announcement, p. 37.

[80] Further Progress, pp. 8-9.

[81] First Announcement, p. 37.

[82] Ibid., p. 36.

[83] *Proto-Indica* : 1968, pp. 38-40.

[84] First Announcement, p. 23 ; Progress, p. 6-8.

[85] For a discussion on the term *vāriyam*, see Mahalingam, T. V., Village Communities in South India, *Transactions of the Arch. Society of South India*, Vol. I (1955), pp. 33–46.

[86] Soviet Studies, p. 11 ; First Announcement, p. 64, No. 1.

[87] M.I.C., II, p. 439, No. 96.

[88] Hunter, p. 70.

[89] Soviet Studies, pp. 11, 21 ; *Psoto-Indica* : 1968, p. 13.

[90] Further Progress, pp. 30–33.

[91] First Announcement, p. 35.

[92] Hunter, pp. 68–69.

[93] The *Cōḷas*, Nilakanta Sastri, K. A., Vol. II, Part I, (1937), pp. 217–30.

[94] *Proto-Indica* : 1968, pp. 36–37 ; 45–47.

[95] Ibid., p. 26.

[96] Further Progress, pp. 25–26.

[97] First Announcement, pp. 28–29 ; The word *peṇṭ(u)* in the sense of a 'comb' does not occur in Old Tamil.

[98] For a different interpretation of the scene, see *Further Progress*, pp. 17–20.

[99] For the Finnish interpretation of the scene, see *Further Progress*, pp. 33–35.

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In Defence of Sri John Marshall

WENDY DONIGER O'FLAHERTY

The two publications discussed here * represent the advances made by archæologists of prehistoric India in the last two decades : Bridget and Raymond Allchin's book is an immensely detailed evaluation of the materials published since Stuart Piggott's *Prehistoric India* (1950), and Sir Mortimer Wheeler has greatly revised his original edition (1953). These two latter works were, in their turn, the product of the discoveries made in the two decades following the pioneering publications of Sir John Marshall (*Mohenjo-daro and the Indus Civilisation*, 1931) and his colleagues E. J. H. Mackay and M. S. Vats. The publication of the most recent finds provides an opportunity to reconsider the development of Indian archæology during these four decades and to evaluate the " major " advances indicated by Sir Mortimer and the Allchins.

It has become the fashion in present-day archæological circles to belittle the achievements of Sir John Marshall, who is criticised primarily for his failure to carry out the excavations at Mohenjo-daro and Harappā in such a manner as to determine chronology and sequence. The Allchins complain that "the excavations lacked precision. and to a large extent were undertaken without the framing of clear-cut objectives " (p. 21); "the earlier excavations of Marshall and Vats are not helpful on this point [the cultural evolution of the Indus cities] " (p. 126) ; " unfortunately, much of the earlier work at Mohenjo-daro and Harappā was of such a kind that its analysis is now scarcely possible " (p. 142). Wheeler does not mince words : " Unfortunately, the older excavators did not record stratification with any regard to precision " (p. 129) ; " the principal excavators (who unhappily recorded their observations with a baffling inadequacy) " (p. 127) ; ". . . the excavator's conclusion, for what it is worth " (p. 131). In addition to this inadequate attention to chronology, Marshall's failure to excavate any prehistoric sites but the great Indus cities during his term as director of the Archæological Survey is occasionally lamented. Thus Marshall is faulted for his failure to establish a temporal and geographic context for the Indus civilisation ; the validity of this criticism will depend upon an evaluation of the progress of archæology in these two respects.

Our knowledge of the geographic extent of the Indus civilisation has certainly been vastly expanded since Sir John Marshall's

day. Even under his administration, Mackay published the finds at Chanhu-daro in 1935 ; Sutkāgen-dor was identified as Harappan by Sir Aurel Stein in 1927, but only in 1962 did G. F. Dales add much detail to this discovery ; work at Rana Ghundai was begun in the late 1930s, and continued in 1950. Much material has been found at Amri, Quetta, Nal, Kulli, and Mundigak, and, even since the publication of Piggott's *Prehistoric India*, important finds have been made at Kot Diji, Lothal, and Kalibangan. None of these sites has yielded evidence of a civilisation of the scale of the great Indus cities ; yet our knowledge of these cities is greatly enhanced by the evidence of these secondary sites. Wheeler remarks upon the long duration of the Amri culture which remains remarkably isolated from that of Harappā, indicating an individuality of these upland cultures in spite of the massive uniformity of Harappan influence. The sites on the Makran coast support the evidence (from Sumerian documents) of Persian Gulf trade and indicate that the eastern half of this trade was in Indian hands : the great dockyard at Lothal suggests the manner in which sea trade with Mesopotamia might have been carried out. As Wheeler remarks : " Recent search has extended the Indus civilisation far down the west coast, giving the Indus people in the aggregate no less than 800 miles of seaboard, with what bearing upon their maritime activities remains to be explored." (p. 2) (Yet even here it must be noted that these finds merely expand our knowledge of a trade route originally delineated by Sir John Marshall on the basis of Indus seals found in Mesopotamia). The great geographic extent of Harappan civilisation, larger than any other known Bronze Age civilisation, is further evidence of the efficiency of the Harappan administrative system—another characteristic originally emphasised by Marshall.

The evaluation of the chronological extent of the Indus civilisation has certainly undergone major revisions since Marshall's day. Even since Wheeler's first edition, new information has come to light regarding the origin and the end of the great Indus cities and the broader context of pre-Harappan and post-Harappan cultures. Marshall estimated that the occupation of Mohenjo-daro extended from 3250 B.C. to 2750 B.C., basing his estimates upon concordances with Mesopotamia. In the light of better stratified excavations at other sites, this period was later changed to 2500–1500 B.C. ; and radio-carbon dating has further narrowed it to 2150–1750 B.C. However, the radio-carbon dates in some instances conflict with other evidence (" Certain dates from series, or for separate sites, which appear to be wildly aberrant are excluded " : Allchin, p. 337), and there are in particular serious anomalies in

the radio-carbon application to the crucial Indus period (Wheeler, p. 110). Nevertheless, there is general agreement between Indian and Mesopotamian chronological evidence. Refinements in cross-dating indicate that occupation at Mohenjo-daro began before the Sargonid phase, a time at which there was already much contact between Mesopotamia and the Indus coast. The implications of this revised chronology are great, and will be discussed at length below.

Radio-carbon dating has been particularly useful in the study of the earliest Baluchistan settlements, which are now estimated at 3500 B.C., later than had been thought, indicating a considerable lag between Iranian and Indian food-producing cultures. It is in the study of these pre-Harappan cultures that Indian archæologists have contributed the greatest volume of material, some of which sheds fascinating light on later aspects of Indian culture : animals are depicted in characteristically Indian ways : the " mother goddess " of Zhob seem to foreshadow the worship of the Goddess ; and tridents found in South Indian Iron Age settlements may be prototypes of the Saiva triśūlas. A major expansion of Neolithic and Chalcolithic civilisation at Amri and Kot Diji took place at the end of the fourth millennium B.C., and the great uniformity of this culture is matched only by the remarkable uniformity of Harappan culture itself. Thus the archæologists proudly indicate their progress in establishing the pre-Harappan context ; but, in actual fact, what have they established? One had assumed that there was *some* context, smaller settlements out of which the greater civilisation grew ; the new discoveries merely push back the barrier in an inevitably frustrated search for the *Urkultur*. The Allchins ask about the origin of the Baluchistan settlements " What were their cultural antecedents? " and then pose the question : " Do the five or more centuries of pre-Harappan culture in the Indus valley provide the matrix within which the extraordinary and in so many ways peculiarly Indian civilisation developed, to burst out suddenly and brilliantly during the closing centuries of the third millennium B.C.? " (p. 123).

This question—the origin of the Indus civilisation—is hardly solved by the archæological discoveries of the past decades. The Allchins characterise the development of Harappan culture as " sudden and brilliant ", and they consider it something of an " explosion ", largely as the result of the control of the Indus valley agriculture (p. 126). Wheeler, too, refers to " suddenness . . . in the actual genesis of the expansive metropolitan culture " (p. 25). In his first edition, he stated the hope that exploration

in Baluchistan and in the depths of Mohenjo-daro itself would perhaps shed light on the origin of the Indus civilisation which "appears to spring into being fully grown". Fifteen years later, the proposed explorations had merely caused him to modify this statement to read (p. 24): "*The nucleus* of the Indus civilisation appears to spring into being fully *shaped*" (italics mine), hardly a significant alteration. These implications of "sudden" genesis are on the one hand naive (for civilisation abhors saltations as nature does; the lacunae are merely in our own understanding); and, on the other hand, they tend to belittle the archæologists' attempts to "explain" the origin of the great civilisations. As Wheeler himself remarks (in all three editions): 'Like other great revolutions, the Indus civilisation may, in origin, best be visualised as the sudden offspring of opportunity and genius, and much playing with potsherds and culture-spreads may help a little to define the opportunity but cannot explain the genius." (p. 25) Marshall, who did much to understand, if not to explain, that genius, is blamed for careless disregard of the stratification of Mohenjo-daro, causing confusion about its early development (the fact that the earlier levels are inaccessible, due to submersion in the shifted Indus river, can hardly be blamed upon Sir John). But Wheeler reached the bottom of Harappa in 1946, and in 1964 George F. Dales drilled below Mohenjo-daro to find thirteen feet of waterlogged accumulation, a fact in which Wheeler sees the possible, and greatly significant, implication that Indus civilisation was a "going concern" well before 2400 B.C. (p. 119). These technical advances, however, tell us little indeed about the actual genesis of the Indus civilisation.

The situation is much the same for post-Harappan cultures. The Allchins claim that "the rediscovery of the post-Harappan culture sequence in region after region of India has been one of her archæologists' most remarkable achievements in the past two decades" (p. 179), but Wheeler comments: "Materially there is a notable absence of any real continuity in the Indus valley between the great civilisation and its beggarly successors" (p. 133). The archæologists may have found physical remains—after all, there were people living in India continuously, as it needs no archæologist to prove—but the cultural implications of these remains are unexciting. Much detail is furnished about Indian life—agricutlure, housing, flora and fauna, weapons—in the eras during which the *Brāhmaṇas* and the *Mahābhārata* were written, but not so much detail as is offered by the literary works themselves, upon which the archæologists constantly draw for supporting evidence (evidence which they are usually surprised to find in turn corroborated by

their own potsherds and copper hoards). D. D. Kosambi has interpreted the post-Harappan material remains in a manner which sheds much interesting light upon early Indian agriculture, economy, society and religion, but his work is barely touched upon by the archæologists. There is some optimism that new sites in Saurashtra may furnish more substantial evidence of cultural links between Harappan culture and the Chalcolithic age, evidence that would be particularly interesting since Saurashtra is a region " remote from primary contact with those invading Aryans whose hand is liable to lie a trifle heavily upon archæological fact or fancy in the Punjab and the Indus valley " (Wheeler, p. 3) ; but Wheeler's hopes that Saurashtra will provide the Indus civilisation with a " rational and related sequel " are as yet unjustified.

The one undeniably great archæological contribution is in the evidence relating to the end of the Indus cities and their relationship to the invading Indo-Aryans. Marshall, who dated the Indus civilisation almost 1,000 years earlier than present-day archæologists have done, could obviously see no connexion between its demise and the Aryan invasions which were then thought to have taken place circa 1700 B.C. Marshall and Mackay attributed the downfall of the cities to the repeated floodings indicated by the stratified ruins and to the vagaries of the Indus river. This view is still given much credence, in various modified forms ; it has been suggested that the Indus altered its course, and that tectonic movements downstream may have occurred. Wheeler suggests that Harappā may have assumed political leadership when Mohenjo-daro was weakened, and that this may also account for the disappearance of Persian Gulf trade after 1900 B.C. (p. 129). Certainly, long before any evidence of invasions, the cities had degenerated ; Mohenjo-daro was " becoming a slum " (Wheeler, p. 127).

Yet evidence of foreign invasion—perhaps facilitated by the already weakened state of the cities due to natural causes—was discovered even in Marshall's time. During the final seasons at Harappā, Vats found Cemetery H, which he considered to represent the final stage of Harappan culture, though incorporating certain foreign elements, mostly Iranian. The Allchins see in this interpretation " a fact of great interest ", indicative of a cultural fusion (p. 149). Wheeler, however, rejects Vats's suggestion that the bearers of Cemetery H culture were the destroyers of Harappā and thinks it wiser not to assume a temporal continuity between Harappan culture and that of Cemetery H (p. 70). Leaving aside the question of continuity, the identity of the foreigners who built

Cemetery H poses a major problem. The Allchins think it most unlikely that there is anything of Ṛg Vedic culture in Cemetery H, in spite of the Vedic references to ruined cities and other possibly Harappan features of the invaded land described in the texts. Cemetery H, they suggest, represented one of the earlier waves of Indo-Iranian invasions, while the Ṛg Veda is the product of perhaps the third wave (1300–1000 B.C.), which brought horses, bronze, and eventually iron, deep into the peninsula (p. 323).

Wheeler dealt at great length, in his first edition, with the evidence furnished by the so-called "massacre graves", indicative of a violent upheaval at the end of the cities; and, although he complains of the imprecision of the excavators' records, the three main groups are clear enough to support the thesis of violence. In this first edition Wheeler concluded: "On circumstantial evidence such as this, considered in the light of the chronology as now inferred, Indra stands accused" (p. 131)—*i.e.*, the Ṛg Vedic Aryans, whose war god was Indra, were responsible for the sacking of the Indus cities. In this, Wheeler followed the lead of V. Gordon Childe, who had shown, in 1934, the possibility of invoking Aryan, if not Ṛg Vedic Aryan, agency for the destruction. In the third edition, however, Wheeler seems at first to regret his accusation of Indra; he refers to it as a "jeu d'esprit" and says that he "once light-heartedly blamed Indra and his invading Aryans". But he then offers the argument, largely unchanged, and remarks that there was hardly reasonable time, after the downfall of the Indus cities, for another civilisation to have arisen and to have built the ruined forts referred to in the Ṛg Veda. He then concludes: "It seems better, as the evidence stands, to accept the identification and to suppose that the Harappans of the Indus valley . . . fell before the advancing Aryans" (p. 132).

There are, however, certain difficulties hedging this theory, in addition to the general difficulty posed by the lack of evidence that Vedic Aryans were present at any Indus site. The domestication of the horse and its use in war chariots is generally associated with the expansion of Indo-European languages (Allchin, pp. 144 and 327); yet Wheeler cites evidence that the bones of a horse were found at Mohenjo-daro and in a pre-Harappan layer at Rana Ghundai; "it is likely enough that camel, horse, and ass were in fact all a familiar feature of the Indus caravans" (p. 82). How can these conflicting statements be resolved? The Allchins deny the validity of the Mohenjo-daro horse (evidence which, it must be admitted, is extremely scanty in the light of the great volume of seals and pottery depicting almost every other kind of fauna but

the horse) : " The only plausible evidence of the horse comes from a superficial level of Mohenjo-daro. It would be unwise to conclude that there is any proof of the regular use of the horse in pre-Harappan or Harappan times" (p. 260). A far more revolutionary solution is offered by another suggestion voiced by the Allchins, in the light of the possibility that the Harappan civilisation only originated in 2150 B.C.; "Not only the end of the cities, but even their initial impetus may have been due to Indo-European speaking peoples" (p. 144).

This would solve the problem of the horse—which would then be an Indo-European horse, not an Indus horse—but conflicts on the other hand with the possibility that the Indus civilisation was a " going concern " well before 2400 B.C., on the basis of Dales's 1964 drilling at Mohenjo-daro. The vagueness of " going concern " —and the unknown nature of the thirteen feet of " waterlogged accumulation "—still allow for the possibility that some other civilisation, pre-Aryan and pre-Harappan, existed at Mohenjo-daro between 2400 and 2150 B.C. ; but this is all extremely speculative. A similar confusion may be seen in Piggot's suggestion that the burning of Rana Ghundai, Dabar Kot, etc., in North Baluchistan coincided with the time of the Indo-Aryan invasions, and the Allchins' suggestion that the destruction of Armi and Kot Diji by fire coincided with the emergence of the new Harappan cultures ; yet this, too, would be resolved by the Allchins' extraordinary suggestion that these two events might have been simultaneous.

It remains to evaluate the new developments relating to the actual Indus civilisation during its four-century duration. The Allchins, while lamenting the Indus Valley emphasis in books on Indian prehistory, nevertheless admit that this civilisation is of unique importance, a great cultural achievement and the origin of many central aspects of Indian civilisation (p. 126). Some information has been offered in recent times to dispel the long-held theory that the climate of the Indus valley in ancient times was much better than it is today ; other than this, little has been added to Marshall's work. Attempts to decipher the Indus Valley script are invalid and likely to remain so until the discovery of a bilingual inscription or at least a long passage. Some details about the script have been asserted—that it is read right in left and then left to right, boustrophed on that it is a syllabary, rather than an alphabet ; that it is a Dravidian language ; that it is the parent of the Brahmi script of ancient India—but this is largely speculative and tells us little about the content of the writing. Indeed, even if it were to be deciphered, it would probably not reveal much

about the civilisation ; for the short occurrences, mostly on seals, are probably almost all proper names.

As for the content of the civilisation, the Allchins remark that information about economy, social systems, government and religion was " largely the product of chance finds in the earlier excavations " (p. 138) ; one suspects a note of sour grapes in the reference to " chance finds ", but elsewhere the Allchins give the devil his due, referring to Marshall's " brilliant chapter upon the religion of the Indus civilisation " (p. 311), and stating that his chapter on art is still the best statement to be found on the subject (p. 355). His adventurous assessments are regarded with uneasy approval : " It is quite unwarranted to suggest an association of this figure [a stone sculpture from Harappā] with the much later icon of Siva as Natarāja, Lord of the Dance, and yet it is as convincing and tempting an ascription today as when Marshall proposed it thirty years ago " (Allchin, p. 306). Marshall's brilliant evaluation of the persistence of Harappan elements in later Indian culture was based upon a wide range of knowledge of Indian civilisation ; the Allchins, by contrast, offer a ıather naive analysis of the structure of Indian society (p. 47).

But perhaps the fault lies in the science rather than in the scientists. Once the initial discovery of the civilisation had been made - an event equivalent in importance to the linguists discovery of Sanskrit and its relationship with Greek and Latin-- a world of cultural implications was revealed, implications which only the cultural historian was able to develop, just as the historian of literature and religion was alone capable of advancing from the linguists' initial premise of the existence of a Sanskrit-writing ancient Indian civilisation to an appreciation of that civilisation. Wheeler remarks upon the paucity of material remains from Harappā ; apart from Harappan plumbing and artistry, we know little of them. He then concludes : " What of their less tangible qualities, their philosophy and their beliefs? Here archæology is of necessity an insensitive medium" (p. 136).

Sir John Marshall had all the glory of the first discoveries ; the archæologists who followed had their painstaking work cut out for them, and they have done it admirably, though it cannot hope to excite historians of ancient India to the same degree that Marshall's publication did. The two most recent summaries, Wheeler's and the Allchins', provide an up-to-date, extensive body of information in great detail, with fine plates, numerous maps and charts, lengthy bibliographies, and many stimulating theories ;

they are well written, Wheeler's being particularly readable, and both are available in paperback editions. These two works are absolutely essential reading for all historians of ancient India, some of whom, it is to be hoped, will be inspired to explore the cultural implications of this fast-growing mass of material evidence of a great and mysterious civilisation.

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* The Birth of Indian Civilization : India and Pakistan Before 500 B.C., by Bridget and Raymond Allchin. Pelican Original. 1968 ; 365 pp. ; 10s.

The Indus Civilization (third edition revised), by Sir Mortimer Wheeler. Cambridge University Press, 1968 ; 144 pp. and 34 pp. ; plates ; 45s., paperback 18s. 6d.

Rescue of a Submerged City

Sir MORTIMER WHEELER

At the invitation of the Pakistan Government a series of UNESCO missions has been considering ways and means of revealing and preserving one of the outstanding monuments of early civilisation, namely, the remains of the ancient city of Mohenjo-daro, 200 miles from Karachi, in West Pakistan. Four thousand years ago this brick-built city, its broad straight streets planned with the chessboard symmetry of a modern American town, spread over an area three or four miles in circuit beside the great river Indus in the former province of Sind, where it was first identified in 1922. Subsequently, large areas of the city were superficially excavated and at once achieved a world-wide fame.

Landmark in early progress of man

At the same time, many other towns and cities of the same culture have been discovered in the Indus system and elsewhere in north-western India, and the "Indus Civilisation," as it is called, is now recognised as the most extensive of the three great civilisations which flourished in the third and early second millennia B.C., the other two being those of the Egyptian Nile and of the Mesopotamian river-system in Iraq.

Amongst the known cities of this Indus Civilisation, that of Mohenjo-daro stands supreme in size and potentiality. On world-values it is a landmark in the early progress of man. To the people of Pakistan it is, in particular, a treasured memorial of the high position of their country in the civilised world four millennia ago, and is, in that sense, both a present responsibility and a stimulus for the years to come. On both accounts—world-wide and national—its excavation and preservation cannot fail to be watched with concern by all who are anywhere interested in the emergence of an elaborate and literature mode of life ancestral in many ways to our own. The appeal of the Pakistan Government, through the UNESCO, for international co-operation in this dual and gigantic task is worthy of the closest attention. At the same

time, the numerous problems inherent in that task have only to be stated to demonstrate both their costliness and their complexity.

To-day, the site of the ancient city is represented by a vast expanse of sandy mounds diversified by clumps of tamarisk and babul bushes and preserved from periodical river-floods by miles of modern bunds or embankments maintained at considerable annual cost. Here and there, excavators during the past half-century have exposed groups of brick buildings upon which our present knowledge of the ancient city is based. But a closer inspection of these excavated structures brings us up at once against the primary difficulty alike of excavation and of adequate conservation. All exposed walls, in a lesser or greater measure, undergo a rapid process of decay from the moment of their uncovering. In a few more years, little or nothing that is meaningful of those already uncovered will remain.

The reason is this. The subsoil is deeply impregnated with salts, and these find their way up into overlying brickwork through the upward trend of the contaminated water, which lies at depths of 2-4 metres or less below the present surface of the flood-plain. The combined effect of water and salts is to disrupt the brickwork which they enter, largely by the physical movement actuated by varying and often extreme air-temperatures.

The paradox of the situation is that, so long as the brickwork remains buried, this movement and disruption do not occur. On the other hand, until the brickwork is revealed by careful excavation, it adds nothing to our knowledge and understanding of one of the great achievements of early civilisation. What is the answer to this problem? It is clear that some compromise must be devised where by the remains of this great Bronze-Age city can be explored in depth and at the same time preserved from the processes of subsequent decay. Successful digging and conservation, coupled with an intelligent policy of tourism, could make the site of Mohenjo-daro as attractive and instructive for its own formative period as, for much later times.

Accordingly, since 1964, of the instance of UNESCO, three successive missions have visited Mohenjo-daro to review the various

aspects of its problems, and to make appropriate recommendations. Two of these missions have dealt primarily with the scientific and engineering aspects of conservation, whilst the third and latest has paid special, though not exclusive, regard to the further development of the site for educational and tourist purposes.

This last mission has, therefore, consisted mainly of an international group of archæologists with recognised experience on comparable sites and problems. They were Prof. J. O. Brew of Cambridge, Massachusetts; Prof. H. J. Lenzen of the German Archæological Institute in Baghdad; Prof. K. Michalowski of the University of Warsaw and the Polish Archæological Institute in Cairo; Dr. Claude Schaeffer of the College de France; Sir Mortimer Wheeler of the British Academy; and Mr. J. Zeper, a senior hydrological engineer from the Netherlands. The mission's report, prepared after consultation with the two previous missions, has recently been accepted by the Director-General of UNESCO.

The report affirms the need for a carefully planned and considerable programme of excavation extending over appreciable areas and carried down in part, probably by the use of tube-wells, to a very considerable depth below the present high level of the subsoil water. Only so it can be hoped, on the one hand, to demonstrate by modern methods the educational potentialities of Mohenjo-daro as outstandingly representative of a great episode in the early story of urbanisation and sociological development, and, on the other hand, to try out methods of short-term and long-term conservation on an adequate scale.

Recent drillings by the engineers suggest that the successive layers of the human occupation of the site may go down to the astonishing depth of sixty feet below the present surface of the plain. Until the lowest level of occupation has been attained, important phases of the early growth and even the maturity of the ancient city must remain unknown. But the task of coping with all this waterlogged material in depth will demand the combined skills of conservationists and archæologists on a world-wide basis, and the backing of financial resources on a large (probably international) scale.

Partial remedies

Apart altogether from the inevitable hazards of deep digging below water-level, the problems of conservation, even on a relatively short-term programme, are full of inadequately understood factors and remedies. Replacement and maintenance of the mud plastering, which, in ancient times aided the resistance of the brick walls to the effects of changing temperatures, must be tried out extensively on freshly excavated walls, before subaerial decay has set in. Similar tests are needed to confirm the utility of carefully maintained cappings to the exposed walls, and of experimental courses of damp-proofing at and near the ground-level of new excavations.

Measures must be taken to see that excavators remove the soil equally from both sides of the walls : in the past, when the saline soil has been removed from one side of the wall but left standing on the other, salts penetrate the wall from the higher fill to the exposed surface of the other side. and overhead shelters designed to protect the excavated areas from the direct impact of rain and sun must be tested for their possible advantages.

These are merely examples of a whole series of possible or partial remedies which await extensive and carefully observed trial by engineers, scientists and archæologists working closely together upon newly exposed brickwork at various depths. It is possible that the considered use of halophyte plants as desalting media may be found to be of limited utility. (Halophyte plants flourish in saline soil, accumulating salts in their tissues). Again it may be stressed that all this involves the pooling of knowledge and experience on a wide scale exactly the sort of task in which UNESCO is uniquely fit to take the lead, in uniting and co-ordinating the efforts of nations towards a purely pacific and cultural end, where local or national resources and skills are almost necessarily inadequate in isolation.

UNESCO has indeed already proved its ability to stimulate international co-operation precisely of this kind. The tremendous international achievement in recent years of recovering or recording an appreciable proportion of the great cultural heritage of Nubia, of which 300 miles are now submerged beneath the great new lake

demanded by the burgeoning population of the Nile valley, is fresh in our minds. Of no less cultural importance and technological complexity is the emergency now presented by the structural predicament of Venice. But alongside these manifest demands upon international goodwill and charity can fairly be placed the exceptionally complicated task of preserving, at Mohenjo-daro, the wide and deep vestiges of one of the great pioneer-cities of the world; vestiges which, properly explored, can tell us much that is worth knowing about ourselves in historic perspective and, properly conserved and displayed can become a major and worthy centre of cultural tourism and education, not for Pakistan alone but for the world at large. (It may be noted in this context that a landing-ground and a regular air service are already available at Mohenjo daro).

The latest UNESCO report has indicated some of the lines along which Pakistan, with the needful co-operation of States and institutions beyond its boundaries, may expect to achieve this desirable cultural end. It concludes by recommending that the Pakistan Government should with the co-operation of UNESCO, establish an over-all "Mohenjo-daro Project", for the purpose of dealing with all aspects of the problem—excavation, conservation, experimentation, tourism—and for exploring all suitable methods of stimulating international participation in the fullest sense.

JOURNAL OF TAMIL STUDIES

Part II

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Archæological Excavations at Korkai

A PANDYAN PORT

(*Express*—26-3-1969)

Korkai, in south Tamil Nadu, was to the early Pandyas what Puhar, to its north on the Coromandal coast, was to the early Cholas ; it was their principal port. Excavations at Puhar by the Central Archæological Survey have brought to light many interesting indications of early Tamil culture. The Tamil Nadu Department of Archæology has now excavated sites at Korkai and found more relics of the early culture.

A brick structure has been laid bare. Interestingly enough, the bricks are almost as large as those found at Puhar. The shell bangle industry appears to have flourished in ancient Korkai, to judge from the finds of shell remains at many places. Before the port town came under the early Pandyas, it appears to have been lived in by megalithic people. A burial site has been uncovered.

In Pandyan times Korkai stood at the confluence of the Tamraparni with the Bay of Bengal. Today it is some five miles inland. The river ran south of the port then ; today it runs north. Korkai is frequently mentioned as a great harbour by the Greek and Roman geographers of the early Christian centuries. It was notable for its pearl fisheries. Pearl fisheries are still conducted near modern Korkai, a striking example of the continuity of a profession.

ARCHÆOLOGISTS AT WORK IN ANCIENT PANDYAN PORT

(*Hindu*-28-3-1969)

The first major excavation work undertaken by the Tamil Nadu State Department of Archæology is at Korkai, the ancient port and the second capital of the Pandyas. Located at the mouth, of the Tambaraparni river, in the Sri Vaikuntam Taluk of Tirunelveli District, Korkai is about 12 miles from Adichanallur, where a number of burial urns has been discovered. It was famous for its pearl fisheries in olden days.

The work at Korkai started in November but came to a halt after about a fortnight owing to heavy rains. The work was

resumed in the first week of March this year, and is now in progress under the direction of Mr. R. Nagaswami, Director of Archæology, assisted by Mr. N. Kasinathan.

Inside the room of the Director, a major find—a well-preserved burial urn—is now kept. It is of beautifully burnt clay but the mouth has been sealed with unburnt clay. It is about one foot and four inches in height with a diameter of about one foot and eight inches. The urn was discovered about five feet below ground level. The Director said that it would take him nearly a week to break open the clay seal gently and take out the contents and scrutinise them. The woik was hampered because water began to seep in at this depth.

Asked about the object of the work now being undertaken, he said they wanted to find the cultural sequence pertaining to Korkai By trial diggings they hoped to arrive at various occupational layers, ever since man first started occupying habitations hereabouts till recent times. The relics so far discovered could be placed from about the Fifth Century B.C., to the First Century A.D.

"Impressive" Finds

Among the finds is an "impressive brick platform" measuring 1·60 metres in length with a flight of steps at one end. There is also a small heap of shells here. The bricks are of large size, 45 cms. long, 28 cms, broad and 3 cms. high, as usually found in ancient structures as at Kaveripoompattinam. Another find from the same trench is an inscribed potsherd carrying an ancient Tamil (Brahmi) inscription that could be assigned to the beginning of the Christian era. A bone arrowhead, a copper hook and potsherds of the megalithic age have been unearthed.

At another place, a burial urn of the megalithic age has been found. The present excavation has revealed, said the Director, that the present Korkai village was a megalithic urn burial site, which subsequently became an occupational site. Roman potsherds,—called rouletted ware—have also been found, thus proving the ancient Roman contact with this former port city. The classical work of the 1st Century A.D., the Periplus of the Erythrean Sea, mentions Korkai as an important port of the Pandyas, known for its pearl fishery.

At the southern end of the village, in the midst of a lake has been found the foundation of a late mediæval structure. Further work is in progress.

Seminar on Archæology

Kodungallur 22nd March 1970

Participants' Report

During 1969–70 the Archæological Survey of India (Southern Circle) in collaboration with the State Department of Archæology, Kerala has conducted some trial excavations in and around Kodungallur to find out the location of Muciṟi or Vānci, the ancient Chera Capital.

A seminar was arranged in Kodungallur on 22nd March, 1970 to discuss the findings and results of the excavations.

A tentative report of the Archæological Survey of India (Southern Circle) was presented by Dr. K. V. Raman. Prof. K. V. Krishna Iyer and Thiru. V. T. Induchudan read papers on related subjects. Prof. S. Velayudhan, M. G. S. Narayanan and several others took part in the discussion.

The report explained the features of the diggings and presented the tentative results of the excavations. Trial diggings were conducted at Tirukkulasekharapuram, Balaganeswaram and Tirukkanamathilakam.

Earlier excavations conducted in Cheraman Parampu during 1946–47 revealed post 14th century remains only. But the present excavations at Tirukkulasekharapuram and Balaganeswaram brought to light red ware potteries, Chinese celadon wares and black roof tiles, datable to a period between 9–12 century A.D.

At Tirukkanamathilakam, which is identified with the Kunavayilkottam of Cilappatikaram, where Ilango Adigal was residing, remainings of a lateritic wall, constructed with huge blocks of laterite, 150 feet length east to west and a width of 4–5 feet was exposed. This is supposed to be a part of a huge rampart (Mathil). In the same place tiles, potteries, Chinese celadon wares, earthern lamps and two coins of Rajaraja (9–10 A.D.) were unearthed. All these remains indicate that this building must be a temple, probably a Jain temple in the past.

In short the present excavations spotlighted the importance of this place during the second Chera Empire (800 A.D.—1102 A.D.).

Part II

According to the report of the Archaeological Survey the lower most stratum or the virgin soil, on which man must have settled first cannot have an antiquity earlier than 7th century. On the basis of this, some scholars hastily tried to fix the date of Cilappatikaram after 7th century A.D. Some others expressed a different opinion. The pre-historic monuments, and the Roman coins of the 1st century A.D. found near Kodungallur showed that man must have lived there even in the beginning of the Christian Era. So the deposits of the period between 1-9 century A.D. can be found in the vicinity of Kodungallur. Only further detailed excavations in future can answer this problem.

K. NACHIMUTHU

S. SATHYAMURTHY

Dravidian Linguistics Papers Exchange

Harold Schiffman, University of Washington

During the recent summer meetings of the LSA at Urbana, and consequently during further discussion at Michigan State among Dravidianists, the plan was formed to set up a " Dravidian Linguistics Papers Exchange " (DRAVLINGPEX). This exchange will have as its purpose the sharing of recent unpublished work on Dravidian languages among, primarily. American scholars and students of Dravidian Linguistics Participants in the exchange will agree to send unpublished working papers to other participants, inviting comments and criticism on a personal or wider basis This exchange would be similar to the PEGS file system carried on by linguists interested in Generative Grammar at various institutions.

It was agreed among the original discussants of the idea to keep the exchange very informal and unbureaucratic. *Participation would be on the basis of institution*, i.e., a department of linguistics of (South) Asian studies at a given university would receive one copy of each paper sent out by the others (and all interested parties at that institution would have access to the papers) ; *each institution would agree to send out at least one paper to other participants during a given academic year. Non-contributing participants would be dropped from the mailing list after a year* to ensure that the venture remain cooperative, and that the mailing list would remain small and unencumbered by dead wood.

To facilitate some of the logistics, one participant would act as coordinator. I have agreed to assume this role for at least the first year. The coordinator would be in charge of keeping participants informed as to what addresses to add or drop from the list, and what number to use on his paper, the intent being that some record would be kept of papers in this way. Each potential participant would contact the coordinator to request that his institution be put on the mailing list, and the coordinator would notify other participants that they should add the new names. Participants would be then wholly responsible for duplicating (dittoing, mimeographing, etc.) their own paper(s) and mailing them to all participants on the list. This function will NOT be the responsibility of the coordinator. There will be no cost involved in this exchange (i.e. membership fees etc.) other than costs incurred by member institutions in duplicating and mailing papers.

Content

The kinds of papers we are interested in exchanging fall into several categories: (1) Original papers written by students and faculty members at various institutions which are not yet published, but which the author(s) or others feel they would like to have comments on, or would merely like to share with others in the field. (2) Papers of a more finished nature, perhaps papers delivered at a conference of some sort, but still unpublished, which the author would like to share with other colleagues. (3) Copies of older, raie, out-of-print papers on Dravidian which one might want to share with others if one had the good fortune to possess such. Copyright restrictions, permission of author, etc., would have to be rigidly respected in this case, to avoid complications.

It is assumed that papers will be on the subject of Dravidian Linguistics only, although some latitude would be allowed to include some excursions into, e.g., literature or anthropology.

Record Keeping

Since papers will be sent out at random intervals from different sources, it was agreed that participants would contact the coordinator, when they are ready to mail out their paper, to obtain a number. Each contributor would entitle his paper as he wished, etc., but somewhere on the title page would indicate that this was Vol. Y, No. Z of the Dravidian Linguistics Papers Exchange. The coordinator would supply numbers as they are requested, to avoid two papers appearing simultaneously with the same number. The coordinator would also keep track of numbers and papers, and periodically send out a summary of the titles which have appeared. Participants desiring back numbers, etc., should contact the author directly. The coordinator might also occasionally mail out bulletins with information of interest to Dravidianists, such as news about forthcoming publications in journals of various sorts, teaching materials newly available, etc.

Membership

There will be no such thing as membership, only *participation*. Participation will be by institution. Only one copy of each paper need be sent to a participating institution. Some sort of coordination at each institution's end will be necessary in order to keep track of whom to send things to. At the moment participation includes only the institutions represented at the informal Urbana

and E. Lansing organisational discussions: Wisconsin (Matson); Chicago (A. K. Ramanujan); Washington (Schiffman): Edinburgh (Asher); Utah (Foley); Missouri (Moag); Michigan (Larkin); Cornell (G. S. Rao); Duke (Ullrich). It is assumed that Dravidianists of Berkeley, Texas, Tulane, Pennsylvania, etc., may also want to be included, as well as those at other institutions. The coordinator looks forward to receiving enquiries from interested parties. Write: H. Schiffman, Far Eastern and Russian Institute, Thomson Hall, University of Washington, Seattle, Washington 98105. Participants who do not *participate*, i.e., contribute a paper at least once a year, will be unceremoniously dropped from the mailing list. Exception could be made to this rule for institutions in India or elsewhere where it might be impractical or impossible to meet this stipulation.

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Dec. 1, 1969

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This is an index of all DRAVLINGPEX Numbers which appeared between September 1968 and September 1969. Requests for additional copies of any back papers should be addressed directly to the author at his home institution.

Number	*Author*	*Institution*	*Title*
1	John Lackstrom	University of Washington	"Rule Changes in Old and Modern Telugu".
2	Andree Sjoberg	University of Texas	"Evidence for a Locative Case in Telugu (with some Dravidian Comparisons)".
3	M. V. Nadkarni	UCLA	"Relativization in Kannada and Konkani".
4	Helen E. Ullrich	Duke University	"A Note on Rural Attitudes Toward Hindi: A Mysore Village Study".
5	Harold Schiffman	University of Washington	"Aspects of Tamil Aspect".
6	E. Annamalai	University of Chicago	"The Semantics of the Verbs Vaa and Poo in Tamil".
7	Michael Garman	University of Edinburgh	"Coorg Verbal Base Structure".

Bibliographical Notes

XAVIER S. THANINAYAGAM (Ed.)

TAMIL STUDIES ABROAD—*A Symposium (vii)*,

269 pp. (*Kuala Lumpur*)

International Association of Tamil Research. 1968, M$ 21·00

One of the most fortunate results of the foundation of the International Association of Tamil Research and the holding, to date, of two International Conference—Seminars of Tamil Studies has been the impetus given to the study of Tamil not only in India and Ceylon but in all parts of the World. This symposium, produced between the first conference, held in Kuala Lumpur in 1966, and the second, in Madras in 1968, shows clearly how world-wide this interest is. South and South East Asia are represented, as are Europe, North America, and Australia; *only in South America as yet does interest in Tamil studies seem slight.*

Most of the individual contributions in this symposium follow an informative historical pattern, tracing interest in South India on the part of scholars and missionaries and travellers of the country concerned from earliest known records. That by Dr. R. E. Asher on the British contribution is particularly fascinating, as he goes at some length into the motivations and views of some of the earliest administrators and missionaries. *The various essays from Europe show with what extraordinary consistency interest in India arose between the sixteenth and eighteenth centuries.* Predictably the *Russian essay shows that country to have antedated the others by a century or so;* significantly it was the horse-trader Afanasy Nikitin whose account, we are told " marks the beginning of factual account known of India " (*Sic* ; See p. 91). This for the Russians, presumably, as *the Chinese traveller Hsuan-tsang went to South India several centuries earlier.*

It is a pity to see that *Portugal and Denmark, both of which were so involved with the history of South India and of Tamil, have so limited an interest at the present time.*

The section by V. I. Subramoniam, 'Tamil studies beyond Tamil Nadu', pp. 119 ff., shows with what success a number of Tamil works have been translated into other Indian Languages. The concomitant spreading by such artists as Smt. M. S. Subbulakshmi *of Karnatic music into North India could also have been*

touched upon, since several essays have ventured outside the strict confines of Tamil.

The printing of this volume is of a very high order, and I noticed few literals; in the Russian section, p. 102, the novelist R. K. Narayan has the initials P. K., presumably through confusion with the Cyrillic *r*, and, in my copy, two pages appeared twice. It will be of interest to see supplements to this comprehensive survey from time to time.

J. R. MARR

(*Appeared in the Bulletin of the School of Oriental and African Studies Vol. XXXII, Part 2, 1969, p. 459*).

KANDAPURANAM IN FRENCH

R. DESSIGANE and P. Z. PATTABIRAMAN

La le'gande de skanda selon le kandapuranam tamoul et l'iconographie.
(Publications : de l'Institut Francais d'Indologie, No. 31) (I), iii, 288 pp. 28 plates.
Pondicherry : Institut Francais d' Indologie, 1967.

Another of the Tamil Saivite Puranas is most competently summarized by Sri R. Dessigane and Sri P. Z. Pattabiraman, following upon their version of Parancootimunivar's ' Tiruvilayatar-puranam ' produced in colloboration with Filliozat.

The Kantapuranam of Kacciyappacivacariyar is one of the most important of the Tamil Saivite Puranaas, and probably the main (and certainly the most copious) source in Tamil of popular puranic stories connected with the God Murukan or Subrahmania. Like the work of Parancooti it is a recension of a Sanskrit purana, in this case of the first six kandas of the Sivarahasyakhanda of the Skandapurana which, as Professor Filliozat rightly points out in his introductory note (p. 11) looks as if it too was composed in the Tamil country.

The summary of the text runs from p. 1 to 226, each short paragraph to clearly separated and accompanied by a reference to the verses of the Tamil original. Such a method again raises the question whether, for the modern non-Tamil reader, summary is not indeed the best way of presenting these stories. Accompanied by a mass of detail and enemeshed in the exigencies of metre, they

progress at so snail—like a pace in the original as to tax the patience of the most devoted student. In 1835, William Taylor did us, and the original, a real service in producing his splendid summary of Tiruvileyatarpuranam, and Sri Dessigane and Sri Pattabiraman now do the same for Kantapuranam. It is worth noting that even in Tamil, a prose summary of Kantapuranam is available [T. Pattucaami Otuvaar, Kantapuranam (vacanam), Kaci Mutt, Tiruppanantaal, 1953]. The value of the summary is perhaps especially noticeable in dialogue, that between Viravaku and Curapanman being a graphic example. (pp. 109–11; cf. Kantapuranam, Makentira kantam, patalam 12, VV. 1–159, Kaci Mutt, ed. 1952, Pt. I, pp. 467–84).

The French summary is followed by a most useful index of stories and a Tamil index in transliteration which likewise is extremely thorough. It is a pity that the transliteration used is so distressing to the eye in still employing capitals for the Tamil characters, ழ, ற and ன. However in view of the adoption by the International Conference—Seminars of Tamil Studies of a similar practice, it is too much to hope for any redress. Perhaps L in Tamil is no worse than the now official government zh ! There is one inconsistency ; Why spell the name of the work Kandapuranam when all other voiced instances of த whether in loan words or not, are represented by t ?.

' La legende de skanda ' closes with a section of plates. It is a pity that the quality of some of these does not meter the really excellent selection and arrangement. Some of the blocks are badly worn. For example fig. 2 of plate XIX, depicting Tirupparankunram, looks as though it has a painted back-cloth, while whoever took the photographs of the modern frescoes at Kankeyanalluur (plates XXVI–XXVIII) ought to have employed steps of a ladder. I particularly like the selection of modern stucco images from the gopuras at Vallimalai (plates XXII and XXIII, fig. 2). Such instances of iconography are too often passed over in favour of the antique.

J. R. MARR

(Appeared in the Bulletin of the School of Oriental and African Studies Vol. XXXII, Part 2, 1969, pp. 457–58).

PARIPATAL IN FRENCH

Le Paripatal, Edited by Francois Gross, Pazhantamizh Noor Solladaivu, Vol. I, Index deas Mots de la Litterature Tamoule Ancienne, Vol. II. Institut Francais d'Indologie, Pondicherry., Price not stated.

The French Institute of Indology at Pondicherry is an organisation of scholars of which little is known to the general public. Its very existence may come as a surprise to many people. But it has been rendering valuable service in many endeavours of scholarship, art and archaeology, history philosophy and religion, and linguistics. Its collection of photographs of monuments in South India is said to be unrivalled.

As a model of exact editing of an ancient text, the first book here a translation into French of the Sangam classic, Paripatal, commands admiration. The editor and translator, Dr. Gross, says modestly that he does not hope to displace the fine edition of Dr. U. V. Saminatha Iyer and that his version is meant for those who do not know Tamil, but wish to study a source of old Hinduism. He also says that his translation has sacrificed elegance to accuracy.

But it is not easy to translate the Sangam classic. Dr. Gross may not have achieved a very "poetical" translation, but there can be no doubt that he has produced a fine scholarly edition. His notes display a profound knowledge of old Tamil literature.

The two other books, an index of words in ancient Tamil literature, are more pedestrian, but equally indispensable to scholars. In his introduction Dr. Filliozat, the Director of the Institute, says that much labour and time has gone into their making. This may be easily believed. Over 300,000 words have been indexed. No praise can be too high for this exacting work of scholarship.

KANCHIPURAM IN EARLY SOUTH INDIAN HISTORY

T. V. MAHALINGAM

This work is the substance of a course of six lectures delivered by the author under the Sir William Meyer Endowment in the University of Madras in 1963. It is mainly the history of the

Pallavas of Kāñcīpuram, one of the distinguished dynasties of rulers in South India, whose period of rule (*c.* 300— A.D. 913) was one of the most creative in South Indian history. During the last forty years and more there has been a steady accession of fresh epigraphical and literary material which has made it necessary and possible to rewrite their history and re-evaluate their place in the general course of South Indian history and culture. Dr. Mahalingam has brought to bear on this work his mature and original thought, an objective approach and unbiassed judgement. Written in a clear and forceful style this work will supply a great need felt by teachers and advanced students of South Indian history.

Dr. T. V. Mahalingam, M.A., D.LITT., Professor and Head of the Department of Ancient History and Archaeology, University of Madras, has been in the field of Indian historical and archaeological research for over thirty-five years. After taking his M.A. degree in History from the University of Madras, he wrote a thesis on *Administration and Social Life under Vijayanagar* which won for him the Degree of Doctor of Letters of the University in 1942. He was awarded the Sankara Parvati Endowment Prize for his thesis *Economic Life in the Vijayanagar Empire.* Both of them were published by the University, and now a revised and integrated volume of the two books is in press. His *South Indian Polity* which was published by the University in 1955 has already gone into the second edition. His *Early South Indian Palaeography,* also published by the University in 1967 with a Foreword by its distinguished Vice-Chancellor, Dr. A. Lakshmanaswami Mudaliar, deals with the origin and evolution of writing in South India with particular reference to the Brahmi Inscriptions in the Tamil country. Dr. Mahalingam is a prolific writer on Ancient History, Archæology, Art and Architecture, Epigraphy, Numismatics, etc. He has to his credit about one hundred learned research papers on Indological subjects.

Dr. Mahalingam has delivered a number of Endowment and Special Lectures in different Universities in India. He participated in many seminars and International Conferences relating to Indian history and culture.

The Indian Express, September 13, 1969

INDIANS IN MALAYSIA AND SINGAPORE

SANNAPPAH ARASARATNAM

XIII, 214 p. 1970—Published for the Institute of Race Relations, London, by Oxford University Press, Bombay, Kuala Lumpur.

A historical account of the development of the largest Indian community overseas, covering settlement under the indenture system and voluntary immigration, and economic progress and social change in the towns and on the plantations. The author's central themes are the growth of political consciousness during World War II and the conflicting loyalties of the Indians in Malaysia, and how far they have maintained their identity as Indians in the present social structure. This history of the Indian community is by and large the history of a Tamil speaking community.

The author is Professor of History at the University of Malaya.

SOCIETY FOR THE STUDY OF SOUTH INDIA

A scholar from U.S.A., writes :

'You may know that a Society for the Study of South India has been established and its 2nd annual meeting was held in Madison, Wisconsin about a week ago. I am sending you a Xerox copy of the program which you may find of some interest in your publicity work. I found the level of discourse to be very high and the place that Tamil had in all this was very substantial indeed. The total number who came to the conference was in excess of 60. I find this to be a very substantial number.'

PROGRAM

The Second Conference of the Society for South Indian Studies,
The Wisconsin Center, University of Wisconsin, Madison, 7-9 April, 1970

THEME :

"Scholarship on South India : Past Achievement, Current Condition and Future Prospect".*

* Proceedings to be Taped by WHA.

Tuesday, April 7 :

1— 2 p.m. : *Late Registration*

2— 4-30 p.m. : Panel : *Language and Literature*

Chairman :

Albert B. Franklin, Kansas State U.

Participants :

George L. Hart, University of Wisconsin Old—Tamil Literature

Franklin C. Southworth, U. of Pennsylvania,—Sociolinguistics

James M. Lindholm and E. Annamalai, U. of Chicago Linguistics

Discussant :

A. K. Ramanujan, University of Chicago—Dialectology

3-00 p.m. : Coffee Break

Wednesdqy, April 8 :

9—11-30 a.m. : Panel : *Caste and Society*

Chairman :

McKim Marriott, U. of Chicago

Participants :

Joan P. Mencher, Columbia U. and Hunter College, Caste and Society

Stephen A. Barnett, University of Chicago, Kinship

Clarence Maloney, Evangel College, Springfield, Moq Early, Civilization

Discussant :

B urton Stein, University of Hawaii

12—1-30 p.m. : *Luncheon : The Wisconsin Center*

2—4-30 p.m. : Panel : *Society and Religion*

Chairman :

Robert J. Miller, U. of Wisconsin

Participants :

John B. Carman, Harvard University, High Religion

William McCormack, University of Calgary, Popular Religion

Joseph W. Elder, University of Wisconsin, Sociology

Theodore P. Wright Jr., S.U.N.Y. at Albany, Islam

Discussants :

Guy Richard Welbon, University of Rochester

Clifford Reis Jones, University of Pennsylvania

6-00 p.m. : Conference Dinner : *The Wisconsin Center*

8-00 p.m. : Evening Session : *History and Society*

University Lecture, by Burton Stein, U. of Hawaii

" Scholarship on Medieval South India, its Past, Presen and Future ".*

Comment and Discussion :

Eugene F. Irschick, University of California

Robert E. Frykenberg, University of Wisconsin

Thursday, April 9 :

9—11 a.m. : Panel : *State and Society*

Chairman :

Robert E. Frykenberg, U. of Wisconsin

Participants :

Lloyd I. Rudolph, University of Chicago, Government and Politics

Brian Murton, University of Hawaii, Geography

V. K. Bawa, Indian Administrative Service, Princely States

T. S. Rama Rao, University of Madras, Law and Courts (paper sent from India)

Discussants :

Suzanne Rudolph, University of Chicago

Eugene F. Irschick, University of California

* To be Taped for Broadcast by WHA.

GOVERNMENT OF TAMILNADU

ABSTRACT

Books and Publications—Journal of Tamil Studies published by the International Association of Tamil Research—Commendation to Public Libraries and Educational Institutions :

Education Department

G.O. (Rt.) No. 127 Education   Dated 28th January, 1970

Read :

From the Chief Editor, Journal of Tamil Studies letter dated 1st January, 1970

ORDER :

The " Journal of Tamil Studies " published by the International Association of Tamil Research which is a continuation of " Tamil Culture " and forms a very valuable contribution to Tamilology and documentation is commended to the Local Library Authorities and to Schools and Colleges for use in their libraries. Copies of the Journal can be had from the I.A.T.R., Thamilakam, Sterling Road, Madras-34. The annual Subscription is Rs. 20 per annum.

2. The Director of Public Libraries, the Director of School Education and the Director of Collegiate Education are requested to bring the publication to the notice of the institution under their control.

(By order of the Governor)

M. RAMASUBRAMANIAM,
Assistant Secretary to Government.

To

The Director of Public Libraries, Madras-6.

The Director of School Education, Madras-6.

The Director of Collegiate Education, Madras-6.

Copy to Thiru Xavier S. Thani Nayagam, Thamilakam, Sterling Road, Madras-34.

(Sd.) *Superintendent*

(True copy)

GOVERNMENT OF TAMILNADU

Abstract

Books and Publications—Proceedings of the First International Conference Seminar of Tamil Studies—Commendation to Public Libraries and Colleges :

Education Department

G.O. (Rt.) No. 217 Education Dated the 6th February, 1970

Read :

From the Secretaries-General, International Association of Tamil Research letter dated 1st January, 1970

ORDER :

The proceedings of the First International Conference Seminar of Tamil Studies in two volumes, which form valuable contribution to Tamilology, is commended to the Local Library Authorities and Colleges in the State for use in their Libraries. Copies of the volumes can be had from M/s. Higginbothams, Mount Road, Madras-2 and the Tamil Conference Secretariat at 27-A, Choudhury Colony, Nungambakkam, Madras-34. Each set of two volumes is priced at Rs. 25C.

2. The Director of Public Libraries and the Director of Collegiate Education are requested to bring the publications to the notice of all the institutions under the control.

(By order of the Governor)

O. RAMACHANDRA RAO,
Deputy Secretary to Government

To

The Director of Public Libraries, Madras-6.

The Director of Collegiate Education, Madras-6.

Copy to Prof. Xavier S. Thaninayagam, Tamilakam, Sterling Road, Madras-34.

(True copy)

ABOUT I. I. T. S.

Prof. Neal M. Bowers, Chairman, South Asia Area Committee, University of Hawaii.

An International Institute of Tamil Studies will do much to fill a present world need for further study and research in a language and culture which up to now has received only limited attention. I am most hopeful that our South Asian Studies Program here will be able to work with you on a cooperative basis as our program expands. Please write me if you have particular questions on our South Asian Studies Program here.

As you know from the booklet given you covering the Asian Studies curriculum at the University of Hawaii, we do not at present offer any presentations in either the Tamil language or culture. *We have three or four faculty, however, with special interests in South India, and hopefully we may be able to expand in this direction in the future.* At present, we are seeking to resolve problems associate with our language situation. Until this is accomplished, our work on India is severely handicapped. . . .

Again let me express my pleasure at having had an opportunity to meet and talk with you. *I am most interested in the International Institute and its development on a cooperative basis with other organizations.*

Prof. Juan R. Francisco, Asian Center, University of the Philippines:

The lines along which the Center can collaborate in the detailed programme of the I.I.T.S. would be in terms of the various aspects outlined in the Brochure you sent us for comment and suggestions, but more specifically with reference to the items I discussed in my letter to you dated March 11, 1969 as supplemented by my letter dated March 13, 1969. In so far as the Center's participation in this collaborative endeavour, *Dr. Cuyugan has designated me to act as laiason between the* Center and the I.A.T.R.-I.I.T.S., since there is no other member of our Center deeply involved in (South) Indian Studies than me. However, *between now and the actual opening of the Institute, we hope to be able to select a prospective scholar whom we can recommend for study at the I.I.T.S.* We have turned our sights on our younger crop of candidates for the M.A. (Asian Studies) who shall be finishing their degrees in a year or two.

The Comments of the various scholars that you cited in your letter, shall help us further in the selection of the nature of our Center's collaboration with the I.I.T.S. I would say that these comments shall provide us broader insights into this projected collaboration, not only with I.I.T.S. but also with the other nations involved in this very worthy project.

I am sending a copy of this letter to our UNESCO Office here to inform them about our decision to collaborate in this project.

Dr. G. D. Sontheimer, South Asian Institute, University of Heidelberg:

At the outset I should like to assure you that *our institute*, including Prof. Berger, Dr. Dhamotharan and myself, *are deeply interested in intensifying the study of Dravidian India. We are of the opinion that Dravidian studies as a regular subject has been a desideratum in the field of German Indology for over 150 years.*

In pursuance of this desire to intensify Dravidian studies, we are agreed that as a first step Dravidian Studies have to be established by filling the chair of our Modern Indian Language Department with a Dravidologist. This would make it possible for students to take up Dravidian Studies as a regular subject leading to the doctoral degree. The difficulty is that new chairs have to be granted by the Ministry of Culture and the Assembly of the Land Baden-Wurttemberg and in the ordinary course they would not grant further chairs for long time to come. In the pastmonths we have repeatedly approached the authorities and have drawn attention to the urgency of the case. We believe now that *in this matter we have established something more than merely to impress the Ministry of Culture of the urgency* of this case. In addition *we shall approach the local UNESCO authorities to enlist their support in the matter.*

The special interest of institute members in intensifying Dravidian studies, and especially Tamil culture, arises from projects and plans of the institute, e.g. :

(1) *Linguistic field research in South India, comparative study of Dravidian and Indo-Aryan languages* (I am appending a note by Dr. H. J. Vermeer, Dept. of Linguistics, University of Heidelberg).

(2) *Archæology : the prehistory of the Indian subcontinent* (I am appending a note by Dr. L. Leshnik, Department of Prehistoric Archæology of the South Asia Institute).

(3) History, e.g. *the connection between India and the East.*

(4) *Anthropology, Ethnology, History of Religions in South India.*

(5) Law : *Customary Law and South Indian Social System. The contribution of South India to the making of Hindu law.*

Note by Dr. Lawrence Leshnik, Department of Archæology, University of Heidelberg :

As I mentioned during your visit, *I think the idea itself splendid, and am quite prepared to offer any possible assistance you may require. In a general way, this would mean moral support. But specifically, I think the cooperation could be a fairly close one. So very little is known about the archæology of South India that research into any period is worthwhile.* My own current studies deal with the megalithic complex in South India, and thus directly touch upon the formative period of Tamil culture. *Investigation into the Stone Ages is desperately needed*, as is an extended knowledge of early farmers. We know next to nothing, for example, about the economic pattern of the South before Sangam times. *There is, to repeat, much to do in the field. At the same time instruction for students could be arranged on some sort of exchange basis.* There are many Indian institutions which offered a good archæological training to students, but nonetheless, *it would certainly be of benefit, to have selected students come to Heidelberg for special purposes. We, of course, would greet the opportunity of being able to send our students to Madras. A similar arrangement for instructors might be feasible.* A very important fruit of such an exchange would certainly be to create more interest in Tamilnad in Europe itself.

As I see it, *the opportunities for a cooperative venture are vast.*

Dr. Hans J. Vermeer, Department of Linguistics, University of Heidelberg :

Today I communicated to Dr. Sontheimer, South Asia Institute, University of Heidelberg some suggestions for a motivation of an International Institute of Tamil Studies in India, mentioning some tasks and projects in the field of Linguistics which seem important to me. . . .

Amongst other important tasks the International Institute of Tamil Studies can, I believe, be very useful in :

(1) promoting Tamil studies as part of a general dravidology, e.g., in the fields of Comparative and Historical Linguistics and Literature. The last publications on the decipherment of the Indus Valley script render this point extremely interesting.

(2) creating a centre for Tamil studies in order to coordinate and guide projects within its scope and at the same time for the registration of completed and newly begun works and of projects, giving liberal information on such schemes as well as special questions (Centre for bibliographical information).

(3) coordinating inter-disciplinary collaboration besides the intra-disciplinary mentioned in the previous paragraph, particularly in the fields of

(*a*) linguistics and literature

(*b*) between these and other fields of cultural and behavioural sciences, e.g. ethnology, sociology, comparative religious investigations etc.

(4) creating a centre for the registration and promotion of special tasks and projects, such as :

Descriptive and Historical Tamil Linguistics and Literature, including dialectology (in both its aspects as regional and social—vertical—dialectology)—Cf. (1) ;—such studies would also include investigations about

(i) early European contributions to Tamil grammar, vocabularies and literature (early Portuguese, esp. Jesuits; Danish missionaries; BESCHI, Ziegenbalg, Graul).

(ii) preparation of modern hand-books on *grammar vocabulary and literature*, employing modern technical means (computer) and team-work of international scale. As for dictionaries, it would be interesting, e.g., to register the earliest available source for words and the history of their meanings.

(iii) interdependance of launguage, literature and culture (incl., e.g., commercial relations).

(iv) *It would be useful to approach linguistic studies from a genuine Tamilian point of view, leaving aside Indo-European terminology,* and in a second approach compare thė results with those of traditional linguistics, *contributing, in this way, to the problem of admitting divergent models of analysis in General Linguistics. . . .*

(v) Studies in Language Typology and Linguistic Leagues (cf. TROUBETZKOY).

(vi) Contrastivity of language structures (e.g. Tamil—English), contributing thus to problems of translation and others.

(vii) Tamil outside India (Malaysia etc.).

(5) supporting Tamil scholars and projects (in—and outside India) by organizing congresses, publications (incl. reprints), scholarships, an international informational review courses (incl. summer and vacation courses) of internationally renowned scholars and on important subjects.

Part II

Dr. Asko Parpola, Scandinavian Institute of Asian Studies Copenhagen :

'The Governing Body of our Institute accepted unanimously my proposal of a regular cooperation with the International Institute of Tamil Studies. . . . We are going to take now contact with the UNESCO Commission and the Foreign Office to carry the project further '.

Mr. G. Strasser, Secretary-General, Netherlands National Commission for UNESCO to the Secretary, Indian National Commission, Ministry of Education, New Delhi :

'I am happy to be able to inform you that the Netherlands National Commission for UNESCO is positively interested in the project and has, after consultations with the institutions concerned, decided to try to further the work of the International Institute of Tamil Studies. . . . The Kern Institute (The State University of Leyden) is particularly interested in the possibility of sending post-graduate students to Madras and in the exchange of scholars and publications. Professor de Vreese (the Municipal University of Amsterdam) mainly offers his collaboration in the field of textual criticism and editing.'

Dr. Pentti Aalto, Professor of Comparative Philology, University of Helsinki :

I have now discussed the International Tamil Institute Project with the Secretary-General of the Finnish Committee and he promised that the *Committee will support the Project at the next General meeting of UNESCO.*

Professor Eric Frykenberg, Department of History, University of Wisconsin :

You will recall from the conversation which we had when you visited us last year that *the Department of Indian Studies in this university expressed an eagerness to collaborate with the International Institute of Tamil Studies* and that we explored various ways in which this might be done. *The results of our*

conversation, while never expressed in written form, nevertheless constituted a commitment and an enthusiasm for projects of mutual cooperation. Specifically, we brought up the possibility for exchanges in teaching and research staff and in graduate study. Should it be possible to find a member of our faculty who is able to exchange positions with a person of comparable interests and qualifications, I have no doubt that arrangements could be made for such an exchange with great profit to all concerned.

Prof. Eugene F. Irschick, University of California, Berkeley :

It is part of our request that at least two, if not three Indian students or professors will be asked to participate in this program in the future. The International Institute of Tamil Studies could easily recommend either a member or a protege who would be taken under consideration in this regard. I can assure you that this responsibility will be taken very seriously by us and I assure that you will do your part as well. As far as our need to use the I.I.T.S. for field work, you will be pleased to know that we plan to have positions for two people concerned with Tamil. One of them would deal with modern Tamil and the other one would be concerned with medieval and. ancient Tamil Literature. . . . As you can appreciate, if we have three or four people in this University whose central interest is in pursuing research vis-a-vis Tamil, we would obviously need to have your support from time to time over the next few years, and I hope that our applications would receive a fair hearing from you.

OBITUARY

The Editors record with deep regret the death on November 26, 1969 of Dr. Rama Subbiah, Acting Head of the Department of Indian Studies, University of Malaya, Kuala Lumpur.

Dr. Subbiah, who was born on January 2, 1933, took his B.A. degree from the University of Malaya and his Ph.D. from the University of London. He had recently been invited by the University of Michigan to initiate Tamil courses during 1970–71 but death snatched him away.

Mr. P. Joseph, an earnest student of Fr. H. Heras, S. J., passed away on February 7, 1970 at Pondicherry, India. His fields of specialization were ancient History of India, Archæology and Dravidian Studies. Until his death he took a lively interest on the decipherment of the Mohenjo-daro script on which subject he wrote a review article which is published elsewhere in this number posthumously.